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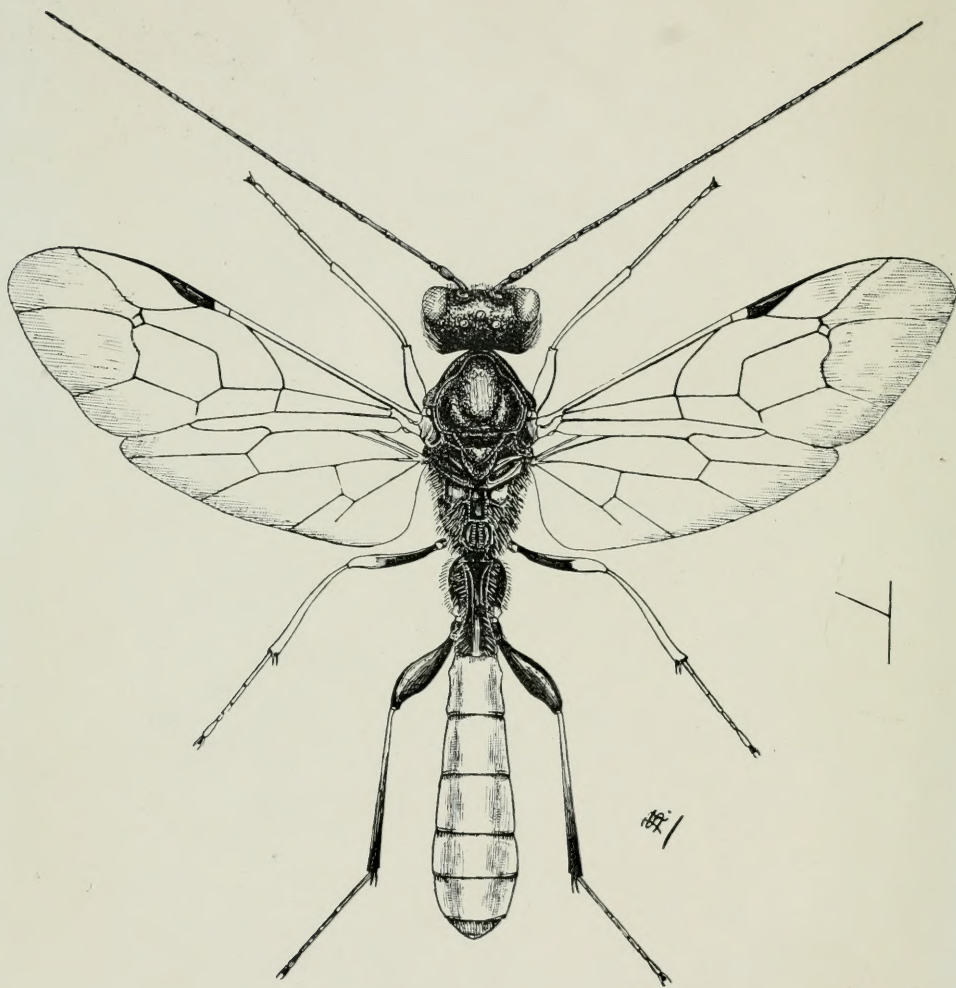
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BRITISH ICHNEUMONS

TRYPHONINAE



Tryphon rutilator, Linn.

Ichneumonologia Britannica, iv.

THE

ICHNEUMONS OF GREAT BRITAIN

A DESCRIPTIVE ACCOUNT OF THE FAMILIES, GENERA AND SPECIES
INDIGENOUS TO THE BRITISH ISLES, TOGETHER WITH NOTES AS TO
CLASSIFICATION, LOCALITIES, HABITATS, HOSTS, ETC.

BY

CLAUDE MORLEY, F.E.S., F.Z.S.

Author of "The Hymenoptera of Suffolk"

"Ichneumoninae of Britain"

"Cryptinae of Britain"

etc., etc.

TRYPHONINAE.

Finis creationis telluris est gloria Dei ex opere naturae per hominem solum.—LINN.

THE AUTHOR IS GREATLY INDEBTED TO
RUPERT STENTON, ESQ., F.E.S., FOR THE
VERY EXCELLENT FIGURES IN THIS VOLUME

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PREFACE.



The completion of the fourth volume of the present work has come upon me somewhat unawares. It was begun with only the vaguest notion of its most natural order, and with no lines whatever to work upon in British literature less than forty years old. Gradually it built itself up, yielding to treatment, until the end was reached in an unexpectedly short time, for it has run concurrently with other work upon parasitic Hymenoptera, which has been thrust upon my hands. On the whole, my own opinion of the result as set forth in the present volume is fairly satisfactory, especially respecting synonymy, though some groups of the Tryphonides require further elucidation, and doubtless many more species of them will be found with us, in spite of the fact that the numbers of these parasites must always be proportionate to that of their known hosts. As regards the Bassides, Exochides and Metopiides, our knowledge is sufficiently full and will compare favourably with that of any country, especially in respect to the Orthocentrini, which have hitherto been everywhere regarded as among the most obscure and indefinite of all Ichneumonidae.

Such difficulty as there may have been in the present volume has lain rather in the great number of our indigenous Tryphoninae, both in species and individuals, than in their correct identification; and the number of species would have been considerably greater, owing to the impossibility of synonymising the older authors' names, were it not that Gravenhorst's types have recently been revised in a very adequate manner. I came to the task facing four hundred and thirty-five species, distributed through only thirty-eight genera, according to my revision read before the Ent. Soc. in 1901; and this mass has now fallen to three hundred and thirty-four species comprised in forty-nine genera. In respect to the genera, a great many more would have been necessary to embrace all those erected by Thomson and Förster; but I do not at all advocate the adoption of genera unless the insects present features of pronounced distinction; a genus is an artificial division to be made use of solely for convenience in nomenclature, and the fewest convenient number should always be adopted. Only the strictest synonymy can account for so great a reduction in the number of species, a few of which have been omitted from the indigenous Catalogue at the end of the volume on the ground of their doubtful occurrence here, though all such are invariably referred to at their correct location in the body of the work. The majority of these are of wide Continental distribution, and the ever-increasing number of our students will soon prove them to be British; the frequent breeding

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operations that are now carried on will ere long show, far more conclusively than can the closest investigations of the littérateur, to what extent species, now considered closely allied, are in reality distinct.

In investigating how far the records of our older authors are reliable, I have had the great advantage of thoroughly working out the entire captures of both Stephens and Desvignes which, with those from Heysham* and others, form the nucleus of our National Collection of indigenous examples. Every specimen has been fully examined, and synonymised to the best of my ability with the names of other authors, while they are further useful in correcting many faulty determinations, resulting from their captors' sole knowledge of Gravenhorst's work; I have frequently been astonished how correctly their Tryphonides have been named from the latter's somewhat bald and superficial descriptions, though on the other hand a great many were, unavoidably, misplaced.

I have adhered to the earlier practice of using a capital letter for those specific titles obtained from proper names. To those of us with some recollection of our classics, such forms as *Cerambyx heros*, *Lycaena adonis* are irritating and objectionable; so too are the titles of gods and men of old mythology given by Francis Walker to hundreds of Chalcididae, when (as is done in the British Museum Catalogue of 1910) they are shorn of individuality and almost of meaning by suppression of the capital letter. Yet more bizarre appear the names of men with whom one holds daily intercourse: see *Thyamis waterhousei*, *Tenthredopsis thornleyi* and *Ripersia tomlinii*, while in the case of great masters of our Science they rankle deeper: *Ichneumon gravenhorsti*, *Stylops kirbyi*, *Stenamma westwoodi*. I utterly fail to find any counterpoise of good purpose served by this arbitrary innovation. It is a quite recent practice and might still, with combination, be successfully combated. I know not where it originated: the British Museum officials have no arguments in its favour except that it is "their usual style," and the English entomological magazines own they simply "follow the custom"—a modern freak!

As in previous subfamilies, it has been my object throughout to set forth what is known rather than to describe new species. If ever the classification of the world's Ichneumonidae is to be reduced to a comprehensible system, it will alone be accomplished by the most rigorous and unstinting synonymy. In its earliest stages, in the works of Linnaeus himself, the dissimilarity of the sexes caused them to be described under distinct names; Gravenhorst did much to reduce synonymy of this sort, but the lack of essential structural features in his own accounts of new kinds rendered the reproduction of the same insects under new names by Wesmael and Holmgren inevitable; and, although this instance of the

*"Dr. T. C. Heysham, of Carlisle; died 6th inst. He was well known, especially in former times, as a Naturalist and Entomologist, and had fine collections." (Ent. Weekly Intelligencer, 18th April, 1857, p. 24). C. G. Barrett's record in the same magazine, p. 29, of an *Ichneumon* which "was a little larger than the common one which infests the larva of *Mamestra Persicariae*, and black, except a band of bright orange-red, extending from the thorax nearly half way along the abdomen," found carrying off a spider, must refer to some species of *Pompilus*, perhaps *P. viaticus*, Linn. He terms his note "Ants, versus Ichneumon and another."

evil has become gradually obviated from time to time as competent students have overhauled the Breslau types, the very indefiniteness of both family and generic characters as we still understand them continues, and will continue, to make redescription unavoidable till interchange of subtypes has become more general than now obtains. This very difficulty has been seized upon by some writers as an excuse for pretending to consider the fauna of a given region or country self-contained, as did Cameron in respect to India, every specimen from which not *thence* already brought forward was published as a new species to Science! The extensive distribution of these parasites, our experience of which is gradually becoming larger and showing it to be extremely wide, greatly facilitates the publication of the same species under different names in distant countries and other continents. Thus, common Gravenhorstian species were reproduced as new in the Journal of the Bombay Nat. Hist. Soc. as recently as 1909 (p. 722) and 1902 (p. 428); while I have caught Japanese, Canadian and Indian species in Suffolk. Let us, then, first learn what is known to others before we contribute to heap yet higher the mass of new-old species which threatens ere long to revert Ichneumonology to the unwieldy chaos whence it has emerged so slowly and with so much patient labour.

In the present volume I have received less assistance than was the case in the preceding, not through any lack of that very hearty co-operation and generosity so universal among entomologists, but on account of the small proportion of the insects dealt with that prey upon Lepidoptera, to which the fifth and final volume is almost entirely devoted. I here thank as sincerely as ever Miss E. M. Alderson, F. C. Adams, E. A. Atmore, E. R. Banks, E. C. Bedwell, Rev. E. N. Bloomfield, A. C. Bowdler, R. C. Bradley, B. A. Bower, E. Brunetti, E. Buckell, E. A. Butler, M. van Burgst, Rosse Butterfield, Prof. J. W. Carr, Dr. R. T. Cassal, G. C. Champion, Dr. Chapman, H. J. Charbonnier, Miss E. Chawner, A. A. Dalglish, Horace Donisthorpe, Hartley Durrant, T. H. Edmonds, Stanley Edwards, Ernest A. Elliott, W. W. Esam, W. Evans, P. de la Garde, J. de Gaulle, Rev. H. S. Gorham, J. N. Halbert, M. Houghton, A. H. Hamm, Rev. W. F. Johnson, G. T. Lyle, J. R. Malloch, A. H. Martineau, G. W. Mason, Rev. F. D. Morice, C. H. Mortimer, E. A. Newbery, Lieut-Col. C. G. Nurse, Rev. O. Pickard-Cambridge, N. M. Richardson, W. D. Roebuck, A. Roman, Hon. N. C. Rothschild, G. B. Routledge, W. A. Schulz, F. W. Sladen, R. South, Rev. A. Thornley, J. R. le B. Tomlin, W. H. Tuck, C. J. Wainwright, J. Waterston, Col. J. W. Yerbury.

The National Collection of British Ichneumonidae has been rearranged uniformly with the present work.

CLAUDE MORLEY.

MONKS' SOHAM HOUSE, SUFFOLK.

May 1st, 1911.

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INTRODUCTION.

It may be well at the outset to indicate the extreme dissimilarity of the Tribes now grouped under the collective term Tryphoninae. These are not only structurally, but biologically distinct, in that the Metopiides and Exochides prey upon Lepidoptera only, the former on large species and mainly Bombyces, the latter on small species and mainly Tortrices; the Bassides attack only Diptera, probably exclusively Syrphidae; the Tryphonides are confined to the extermination of Sawflies, for I am convinced that the few species of lepidopterous parasites still here retained in our artificial classification are misplaced. Thus the cocoon of Euceros exactly resembles those of the Pimplid Lissonotides, many of whose females have but shortly exerted terebra and very similar sculpture; Scolobates was treated of under the Ophioninae by Holmgren, and though relegated to the present subfamily by subsequent authors, there are many points of agreement therewith in the genus. The Sphinctides are so entirely unique in conformation that I have not considered it necessary to place our single species in the table of tribes; the discovery of a second representative of the genus from India conducts us no further to a knowledge of its natural position, which is apparently closest in the structure of both imago and cocoon to Metopius.

Further evidence of the unnatural association of the tribes is furnished by their geographical distribution. The Bassides, Metopius and probably Exochus are found generally throughout the globe; while the Tryphonides, on the other hand, are very nearly confined to the temperate regions of both hemispheres, extending from southern Lapland hardly beyond the Mediterranean and eastward to the central altitudes of the Himalayas, while they abound in the United States and southern Canada, though becoming less frequent in Mexico. I recall having seen none from so far south as the twentieth degree of latitude; and this is accounted for by the infrequency there of Sawflies, upon which all their genuine species exclusively prey, though further research will doubtless prove the existence of Tryphonides indigenous to the few Australasian Tenthredinidae.

Gravenhorst placed Trachyderma (Tylocomnus, Holmgr.) under Pimpla, in ignorance of its female; Metopius, Euceros and Orthocentrus he united to Bassus in his eighth genus; while Tryphon consisted of Sphinctus, Scolobates and Exochus with Mesoleptus and Tryphon, under

the two last of which nearly all our Tryphonini, Cteniscini and Mesoleptini were grouped. This chaotic mass was reduced to remarkable order under Holmgren's masterly hand in 1855; the whole was treated under the four heads we still retain: Metopiides=his Tryphonides aspidopi, Exochides=his Tryphonides prosopi, Bassides=his Tryphonides schizodonti, and the Tryphonides=his Tryphonides homalopi. I became familiarised with his system so long before assimilating the somewhat scattered one of Prof. Thomson that in the present work I have, perhaps to too great an extent, followed his nomenclature, admitting additional genera only when their facies are perfectly distinct, and introducing Ashmead's section of the last Tribe, erected on the unguinal pectination.

Great as the progress undoubtedly has been during the last thirty years towards a natural grouping of this subfamily, much yet remains to be accomplished and, after protracted research, I am still, in presenting this volume, left in considerable doubt respecting the nearer affinities of the Orthocentrini or Ctenopelmini with the Ophionid Plectiscides: in attributing it to the latter, I must own to the consideration of convenience. Orthocentrus is undoubtedly related to Promethus and Zootrephus in the conformation of both areolet and basal segment, the Bassides are allied in their mandibular structure only with Metopius and in general facies cannot be superficially distinguished from Mesoleius. To have placed Orthocentrus last in the present volume would have necessitated the total revision of its order. Beginning with the Tryphonides, we should have been led by three equal affinities (the resemblance of Mesoleius, mandibular structure of Metopius and similarity of the smaller Polyblasti) to the Bassides, while the Plectiscoid Ctenopelmini would altogether have fallen out of line; thence the convex face and glabrous petiole of Exochus would have barred natural continuation to the Orthocentrini, which, indeed, might with but little impropriety be placed in the Plectiscides proper rather than in the Exochides, especially since the evidence of its economy, as far as it is at present known, relates much more distinctly to the Diptera than to the Tortricid Lepidoptera.

Nothing has appeared upon this subfamily in our language but the descriptions of a few additional and new species by Bridgman and Parfitt, since Stephens translated those of older authors and brought forward some of his own, in all a hundred and fifty kinds, more or less unreliably recorded, in 1835. Desvignes' Catalogue of 1856 only raises the total by eight, and many of these are synonyms; next followed the same author's new Bassi in 1862, nearly all antedated by Holmgren's work. Marshall's first list showed two hundred and twenty-six, excluding many unplaced kinds of Mesoleptus and Tryphon in 1870; and his more pretentious Catalogue extended our total to three hundred and one, two years later. Then came Bridgman's annual additions, which, with those from other sources, totalled a hundred and thirty-three, showing the entangled mass

of often synonymous British species to amount to over four hundred in 1901, now greatly reduced through careful comparison of descriptions and type specimens.

A TABLE OF FAMILIES OF THE ICHNEUMONIDEA (PARASITICA).

(2).	1.	Abdomen emitted from the metanotum ..	EVANIIDAE.
(1).	2.	Abdomen emitted from the apex of meta- thorax.	
(8).	3.	Front wings with discoidal nervures.	
(7).	4.	Terebra rising from near apex of the usually deplanate abdomen.	
(6).	5.	Front wings with two recurrent nervures	ICHNEUMONIDAE.
(5).	6.	Front wings with one recurrent nervure	BRACONIDAE.
(4).	7.	Terebra rising from near base of the usually compressed abdomen ..	CYNIPIDAE.
(3).	8.	Front wings with no discoidal nervures.	
(10).	9.	Prothorax not reaching base of wings; venter emitting terebra	CHALCIDIDAE.
(9).	10.	Prothorax reaching base of wings; anus emitting terebra	PROCTOTRYPIDAE.

A TABLE OF SUB-FAMILIES OF THE ICHNEUMONIDAE.

(4).	1.	First segment basally contracted; areolet pentagonal.	
(3).	2.	Mesosternum not sulcate; terebra con- cealed	ICHNEUMONINAE.
(2).	3.	Mesosternum sulcate; terebra exerted	CRYPTINAE.
(1).	4.	First segment not petiolate nor areolet pentagonal.	
(8).	5.	Abdomen dorsally deplanate; postpetiole broad.	
(7).	6.	Metanotum rarely longitudinally costate; terebra exerted	PIMPLINAE.
(6).	7.	Metanotum usually longitudinally costate; terebra concealed	TRYPHONINAE.
(5).	8.	Abdomen laterally compressed; post- petiole linear	OPHIONINAE.

SUB-FAMILY

TRYPHONINAE.

The peculiarity of the present subfamily is its almost entire restriction to the palaearctic and nearctic regions, on account of the scarcity of Tenthredinidae in the warmer and southern countries. This more especially applies to the Tryphonides proper, for the Exochides and Metopiides are in no way connected therewith in Nature and are grouped under the common head because they share with them the characters of more or less sessile abdomen and concealed terebra. These two Tribes are really Subfamilies of equal dignity with the rest of the Tryphoninae, under which the Bassides and Tryphonides can alone be truly placed, and they differ from each other so little as to be scarcely divisible till the mandibular structure be examined. To the Pimplinae none are at all closely allied, unless it be in the rugulose body of Metopius or the trans-impressed segments of Bassus; to the Ophioninae, on the other hand, both the Exochides and Ctenopelmini appear to lead up so naturally that it is difficult to tell which should be placed next them, and I have given the preference to the latter as being of lower specialisation.

A Table of Tribes.

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|------|--|--------------|
| (2). | 1. Scutellum quadrate, its apical angles produced; face scutiform .. | METOPIIDES. |
| (1). | 2. Scutellum simply triangular; face not centrally concave. | |
| (4). | 3. Face very strongly protuberant, with frons apically concave | EXOCHIDES. |
| (3). | 4. Face not protuberant, frons simply deplanate or convex. | |
| (6). | 5. Mandibles with three apical teeth .. | BASSIDES. |
| (5). | 6. Mandibles with the upper tooth simple, not bifid | TRYPHONIDES. |

The first two of these tribes are very highly specialised and distinct from the remainder, both in their structure, which is entirely peculiar among Ichneumonidae, and in their hosts, which alone in the present subfamily are sought among the Lepidoptera, in the former usually the Bombycidae and in the latter mainly the Tortricidae. The Bassides appear true Tryphoninae with peculiar mandibular modification, which it is very difficult to associate with the functions of a Dipterous diet, for they are proved to prey detrimentally upon the Syrphidae, so beneficial in the destruction of Aphididae. All these with the Cteniscini, are easy of recognition, but the remainder of the Tryphonides possess such indefinite generic characters, by no means simplified by the modern thirst for generic multiplication, that it has cost considerable labour to distinguish them in Nature, since their features are homogenous to a bewildering degree and the distinctions often minute.

TRIBE

METOPIIDES.

METOPIUS, *Panzer*.

Panz Krit. Revis. ii (1806), 78; *Peltastes*, Illig. Rossi, F. E. (1807), 55.*

The tribe Metopiides was divided from the remainder of the Tryphoninae by Holmgren under the name *Tryphonides-aspidopi* in 1855; it is exceedingly distinct from all other Ichneumonidae and is represented in Europe by the single genus *Metopius*, characterised thus:—

Head not large, transverse and usually anteriorly flavous-marked; face prominent above, centrally concave with the margin elevated throughout or obsolete below; mandibles apically entire or emarginate; maxillary palpi with the second joint incrassate. Antennae somewhat stout and subattenuate at both extremities, usually more or less rufescent, especially beneath. Thorax stout, dull and often with small flavous marks. Scutellum quadrate, apically broadly truncate and often flavous, with the lateral margins elevated and the apical angles subspicately produced. Abdomen sessile, subcylindrical, strongly and rugosely punctate, black with most of the segments flavous-margined and the first very short; seventh segment of ♂ half length of sixth, of ♀ very short and hardly exerted; terebra hidden. Hind femora incrassate and often subfusiform; intermediate tibiae unicalcarate. Wings flavescent and not broad, with their apices sometimes infumate; areolet large and transverse-quadrangular. Size large.

The species of this genus are connected with the Pimplinae through their American genus *Cultrarius* with exerted terebra, and with the *Bassides* in the apically bifid upper tooth of the larger species and the roughly sculptured abdomen, though they materially differ in the total lack of a lower tooth, as well as in the unique conformation of their face, scutellum and areolet. The superiorly produced face and subincrassate hind femora ally them with the following tribe. But one species has until now been added to our fauna since 1824.

It is strange that so strikingly large and handsome species as are those of this genus should have received such scant attention; and one can but presume that they are sufficiently uncommon everywhere to have escaped especial study. The only at all detailed observations I have seen are those of M. Doumerc upon *Ichneumon fasciatus*, Fourc. He says (Ann. Soc. Fr. 1860, p. 319) that towards the end of July, 1858, he found one healthy and one sickly larva of *Saturnia carpini*, the latter of which at once began to spin its cocoon and the former shortly followed suit. A perfect ♂ of the Bombyx emerged from the former during the following April, but not till June, 1859, did a specimen of the *Metopius* emerge from the second chrysalis, through a lateral hole in the thorax. He records another from the same host, which he saw in Sichel's collection, affixed to the cocoon; and a third from southern France, taken in the same

* *TYLOCOMNUS*, Holmgr.—I can only remark with Westwood (Introd. ii. Synop. 59) that Stephens introduces Gravenhorst's genus *Trachyderma* as British (Illus. Mand. vii. 126) between *Pimplinae* and *Tryphoninae*, but as the British species are not yet indicated, I cannot give an example. The only one known to Grav. is his *T. scabra*, which is rare, of transitional form between these two subfamilies, and found sparingly in Sweden, Russia and France. Mr. Turner has given me a fine ♂, taken "near Macunagna" by Mr. Stanley Edwards in July, 1899; this specimen, the latter informs me, was captured in Italy, on the eastern slope of Monte Rosa, in the Pennine Alps

locality as this moth. His petition to "Hyménoptérophiles à compléter à l'occasion les détails qui m'ont échappé sur les mœurs de cet insecte" has hitherto met with no response, excepting from M. l'abbé J. Dominique, who has "quelques mots sur les Metopius de la Loire-inférieure" in Bul. Soc. Sc. Nat. Ouest-France, 1898, p. 83; he evidently did not know the five new species described by Arn. Förster in "Eine centurie neuer Hymenopteren" (Verh. pr. Rheinh. 1850, p. 277).

M. Doumerc synonymizes his parasite with *M. micratorius*, Fab.; in all other instances but a doubtful one, that species has been bred from much smaller moths, while *M. dentatus*, Fab., is, as far as at present can be ascertained, exclusively attached to Bombyces. Hence I consider M. Doumerc's observations, of which we saw something under *Hemiteles floricator*, Gr. (Ichn. Brit. ii. 145), better placed generically. This genus preys on Lepidoptera and the two doubtful instances of van Vollenhoven from Tenthredinidae are almost certainly errors.

Those caring for a broader knowledge of the genus may consult my attempt to tabulate the world's species, about to be published by the British Museum Trustees.

Table of Species.

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|------|--|-----------------------|
| (2). | 1. Mandibles apically bifid; 2nd recurrent nervure bifenestrate .. | 1. DENTATUS, Fab. |
| (1). | 2. Mandibles mutic; second recurrent nervure unifenestrate. | |
| (4). | 3. Radial cell not determinately infumate | 2. MICRATORIUS, Fab. |
| (3). | 4. Radial cell very determinately infumate. | |
| (6). | 5. Frons acutely cornute; legs entirely black | 3. FUSCIPENNIS, Wesm. |
| (5). | 6. Frons mutic; legs usually broadly pale. | |
| (8). | 7. Abdomen caeruleous; scutellum laterally rectangular apically .. | 4. DISSECTORIUS, Pz. |
| (7). | 8. Abdomen black; scutellum laterally spinose apically | 5. PELTATOR, Marsh. |

1. *dentatus*, Fab.

Ichneumon dentatus, Fab. S. I. i. 436; Gmel. S. N. 2707, ♂. *Pimpla dentata*, Fab. Piez. 119. *Peltastes pini*, Curt. B. E. ed. i, pl. iv. *P. dentatus*, Curt. l.c. ed. ii, pl. iv, ♂; Farm Ins. 485. *Metopius dentatus*, Gr. I. E. iii. 304; Wesm. Bul. Ac. Brux. 1849, p. 629, ♂ ♀; Holmgr. Sv. Ak. Handl. 1855, p. 374, excl. ♂; cf. Sichel et Gouley, Ann. Soc. Fr. 1865, p. xxvi (*nec* Voll.). *M. interruptus*, Thoms. Deut. Ent. Zeit. 1887, p. 197, ♂ ♀.

Head with the face of ♀ laterally flavous, of ♂ with palpi, mandibular mark, the clypeus and whole face concolorous; mandibles apically emarginate; face distinctly carinate above and below. Antennæ black or at most infusate above; beneath with flagellum fulvous and scape nearly always flavous-marked. Thorax with a line before and a smaller one beneath radices, often two metanotal marks and in ♂ a subperpendicular mark on the mesopleuræ, flavous. Scutellum with its basal angles, apical margin, and in ♂ a transverse line on the postscutellum, flavous. Abdomen with apices of all the segments pale stramineous, those of the first always and second sometimes alone centrally interrupted. Legs of

♀ black with all the tibiae, tarsi, apices of femora and of the hind trochanters, testaceous: of ♂ flavous with only the hind coxae mainly, and their femora internally broadly, black; hind femora subcylindrical and not incrassate. Wings flavescent with radix and tegulae black or flavous-dotted, in ♂ entirely pale; stigma and costa fulvous. Length, 15—23 mm.

Wesmael gives a ♀ variety with the flagellum entirely fulvous at least basally, a transverse flavous mark on the mesopleurae and the tegulae entirely concolorous; Holmgren's ♂ is co-specific; this Thomson has erected into a distinct species under the name *M. croceicornis*, which I have not seen in Britain, though Rev. H. S. Gorham has given me an example from Brittany, and it may be synonymous with the *Ichneumon chrysopus*, Lewin bred from *Phalaena Trifolii*, and Marsham described "antennae setaceae flavae" &c. in Trans. Linn. Soc. 1797, p. 4, pl. ii, fig. 5. These two species constitute Thomson's subgenus *Peltocarus*, distinguished by its apically bifid mandibles, deplanate oral costa and distinctly bifenestrate second recurrent nervure. The facial concavity of *M. dentatus* is more determinate below and its abdomen more finely sculptured; but Thomson's other characters appear variable and unreliable.

This is decidedly the largest species of its genus with us, and appears to be very widely distributed but rare everywhere in Britain, as it is upon the Continent, where Wesmael regarded it as very uncommon in Belgium; he knew it from Bordeaux and Florence; and it seems sparsely distributed over central and northern Europe. Curtis says (B.E.) that it "has been taken in June by Mr. Bentley and Mr. Dale, near Ringwood, Hampshire, flying amongst pine-trees, in the sunshine; and by the latter gentleman also on the heathy side of a mountain near Ambleside, Westmoreland"; he adds that it has been bred from the pupa of *Lasiocampa Trifolii*, to which he considered (Farm Ins.) it to be especially attached. Two were taken in August, 1831, by A. H. Davies, F.L.S., on the moors about Halifax in Yorks (Loud. Mag. 1832, p. 248, No. 25); one bred from *Bombyx callunae* at Keighley and given alive to Roebuck on 13th May, 1873; another bred from the same host from Rombald's Moor; others taken at Huddersfield by Bairstow and Varley, and at Halifax by Cash (Roebuck, Trans. Yorks. Union, 1877, p. 39); and at Bradford (l. c. 1878, p. 69). Bairstow records a fine ♂ from Goole Moor and speaks of it (l. c. 1882, p. 107) as of frequent occurrence in Yorkshire, saying that all those he had received from the East Riding were considerably larger than those from the West. A doubtful specimen taken at Pett (Vict. Hist. Sussex); Parley Heath, Dorset (Dale, Lepid. Dorset), and Rev. O. Pickard-Cambridge has given me a ♂ from the same county. A ♀ was bred from larva of *Bombyx callunae* in 1907 at Midgley, near Bradford (Rosse Butterfield; misnamed by me in Bradf. Sc. Journ. 1908, p. 71). Davies found a specimen had emerged in his breeding cage on 6th June from *Bombyx quercus* at St. Issey, Cornwall (E. M. M. 1901, p. 171); and both Giraud and Mocsary have bred it from the same host. Bignell also records it from this host (Ichn. of S. Devon); and Parfitt raised it from a *Lasiocampa quercifolia* pupa (Ichn. of Devon). I have once seen this species in the Bentley Woods, near Ipswich; Mr. Edward Buckell has given me a ♂, probably taken at Romsey in Hants; I possess two with no data from Beaumont's collection; and a somewhat immature ♀, given me by Mr. J. B. Gordon, who "found it dead in the cocoon of *Saturnia carpini*, whence it had failed to emerge, on a great

flat moss," in Wigtownshire, on 13th May, 1902. There are two "British" specimens in Marshall's collection and eight from Stephens', Desvignes' and Heysham's in the British Museum.

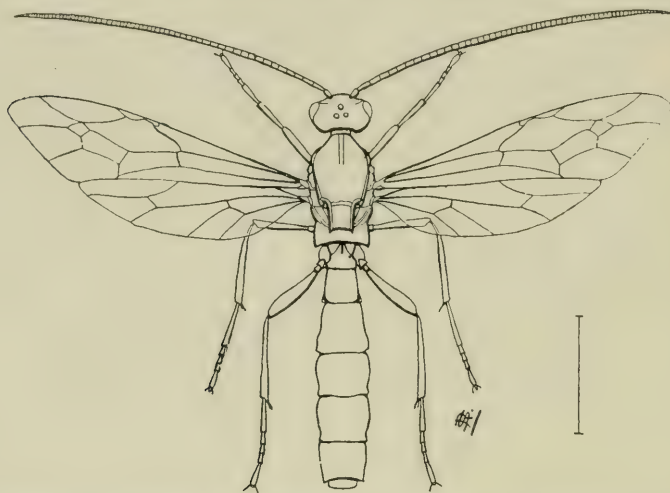
On 9th May, 1911, a ♀ of this species emerged, from a pupa of *Bombix quercus*, var. *callunae*, received in the autumn of 1909 from Arran, in the breeding cage of Mr. B. A. Bower, who kindly forwarded it to me. It arrived in a lively condition on 11th morning, and at once lapped moistened loaf sugar as soon as presented with great avidity with its ligula, but without any motion of the closed mandibles. I noticed that when annoyed at restraint it emitted a high note, resembling that of a *Bombus* in similar circumstances, evidently caused by the visible though rapid vertical vibration of the lower wings, for the tone was unchanged by fastening together the upper wings, which in rest are folded horizontally upon each other. The flight is accompanied by a deep buzz, resembling that of *Trichosoma*. I never saw the antennae laid back upon the thorax, as does *Exetastes*, but they were held at rest slightly curved backwards with the basal half at right angles to and on a level with the body. I kept it loose in my study till the morning of the 16th when, after detrimental adventures with a large spider (*Segestria senoculata*, Linn., I think) that could not secure so large a prey, and the sticky sugar that proved detrimental to its wings, it was found to be moribund. On 12th and 13th I tried "assembling" with no results; I thought possibly the habits of host might be perpetuated in the parasite.

2. *micratorius*, Fab.

Ichneumon fasciatus, Fourc. E. P. ii. 428; Vill. Linn. Ent. iii. 192; *I. lunulatus*, Vill. lib. cit. 203; Oliv. Encycl. Méth. vii. 219; Rossi, Mant. 122; *I. variegator*, Rossi, F. E. ii. 46 (?). *I. micratorius*, Fab. Piez. 62, ♂; Jur. Nouv. Méth. 108, ♂ ♀. *Metopius micratorius*, Panz. Krit. Revis. ii. 79; Trentep. Isis, 1826, p. 295; Gr. I. E. iii. 299, ♂; Wesm. Bul. Ac. Brux. 1849, p. 625; Holmgr. Sv. Ak. Handl. 1855, p. 373, pl. ix, fig. 25, ♀; Kies. Berl. Ent. Zeit. 1861, p. 192; Thoms. Deut. Ent. Zeit. 1887, p. 195; O. E. xix. 2129, ♂ ♀. *Peltastes micratorius*, Illig. Rossi, F. E. ii. 55. *P. fasciatus*, Doumerc, Ann. Soc. Fr. 1860, p. 317. *Metopius necatorius*, Gr. I. E. iii. 292, ♀; Voll. Pinac. pl. xvi, ff. 3 et 4, ♂ ♀. *Peltastes necatorius*, Illig. Rossi. 55; Curt. B. E. fol. 4, ♀; Sam. Ent. Cab. ii. 16.

Head with face of ♀ with all or only the lateral margins more or less broadly flavous, of ♂, as well as the mouth, entirely flavous; frontal orbits concolorous; mandibles apically black, acute and not emarginate; facial concavity subovate and longer than broad. Antennae black with the flagellum beneath entirely, or only towards the base, ferrugineous; scape black, and usually flavous-marked beneath. Thorax black with a line before and callosity beneath radices, two marks on metanotum and often others on mesopleurae, usually flavous. Scutellum scabrous, black, usually with the apical angles or whole apex, and in ♂ rarely two post-scutellar dots, flavous. Abdomen with the anus sometimes sub-caerulescent; first segment very short and flavous with its base, and in ♀ generally a central longitudinal line black; second with only a flavous dot in each of the apical angles or very rarely the whole margin narrowly flavous; third to fifth and often sixth flavous-margined, seventh rarely concolorous. Legs black with the trochanters of ♂ entirely and of ♀ more or less broadly apically, the anterior femora more or less laterally and the hind ones sometimes basally, all the tibiae with the anterior of

♀ usually externally infusate and the hind ones usually more or less nigrescent apically, and the ♂ anterior coxae, flavous; tarsi flavous or ferrugineous, with the hind ones usually apically darker; hind femora stout and subfusiform. Wings but slightly and indeterminately clouded apically; stigma and radius fulvous; radix and tegulae black, the former sometimes in ♂ flavous-marked; areolet petiolate. Length, 11—15 mm.



Gravenhorst instances a ♀ variety with the thorax, except sometimes the apex of the scutellum, immaculate.

As is pointed out by Thomson, this species is similar to *M. connexorius*, Wesm., in size, the colouration of the abdomen and legs, and the inferiorly striolate pronotum, but differs in having no elevated clypeal carina and in its scabrous scutellum. From *M. brevispina*, Thoms., it may be known by its petiolate areolet, more finely punctate 6th ♀ and 7th ♂ segments, and by the longer calcaria. It is among the largest of Swedish species of the genus.

This is probably our commonest British species of the genus, though I have never met with it myself. Fabricius records it from Germany, Grav. from Silesia, Brunswick and Piedmont in July and August on *Umbelliferae*, Wesmael from Belgium; Holmgren says it is not infrequent in gardens, woods and fields in Sweden, and Thomson gives it a range throughout northern and central Europe. I have placed Doumerc's remarks upon this species generically. It has frequently been bred:—from *Arctia urticae*, Esp., by Boie, *Clisiocampa neustria* and *Cnethocampa populi* by Rondani, *Bryophila ravulana* by Goossens (Giraud) and *Dianthaceae* (Gaulle); *Dicranura erminea* and *Saturnia pyri* (Dalla Torre), and *Harpyia bifida* and *Acronycta psi* (Brischke). Curtis records it from Southwold in Suffolk, and the Plaistow marshes near London; adding that it has been bred from the pupa of *Stauropus fagi*; Tuck has given me a ♀, which he took on nettles on the Common at the former locality on 16th Sept., 1899, and he saw a second at the same time, mistaking them in flight for the aculeate, *Gorytes mystaceus*, Linn. Dale mentions it from Knighton Heath, Dorset (Lep. Dorset); a ♂ captured on Rombald's

Moor in 1878 (Bairstow, Trans. Yorks. Un. 1882, p. 107): "captured on flowers of umbelliferae on woodsides in July; taken also in the Plymouth district" (Parfitt, Ichn. of Devon). There are two specimens in Bridgman's collection at Norwich, one of which, he tells us, was captured at Brundall and adds that Paget records it from about Yarmouth. Its only record (Entom. xvi, p. 67) from *Bombix callunae* is probably an error (cf. also Nat. Journ. 1899, p. 14). My only ♂ was captured by Mr. Charbonnier in 1900 near Bristol; I have ♀ ♀ taken by the late C. J. Watkins at Painswick in Gloucester and by Atmore, who told me they were not rare, in a town garden in King's Lynn, Norfolk, in July, 1903. There are a dozen specimens in the National Collection from Stephens' and Desvignes' collections, one of which is from Dr. Leach's, and another (probably that referred to above) as bred from *Stauropus fugi*, as also is a specimen from Stephens' "Economic" cabinet. Dominique states that *M. necatorius* attacks both, *Gastropacha lanestris* and *Agrotis fimbria*.

3. *fuscipennis*, Wesm.

Metopius scrobiculatus, Htg. Jahresb. 1838, p. 272; Ratz. Ichn. d. Forst. i. 122; cf. lib. cit. ii. 109 et iii. 117, 175 (?). *M. fuscipennis*, Wesm. Bull. Ac. Brux. 1849, p. 623; Holmgr. Sv. Ak. Handl. 1855, p. 372; Thoms. Deut. Ent. Zeit. 1887, p. 194, ♂ ♀; Voll. Pinac. pl. xvi, fig. 1.

Head with an erect and strongly acute horn behind the antennae; facial margin elevated and nearly always flavous, with a concolorous dot at the juxta-antennal orbits; mandibles apically acute and not emarginate. Antennae dull ferrugineous, with the scape flavous-marked, beneath. Thorax black with a flavous dot at basal angles of the scutellum, sometimes wanting in ♂; notauli extending to disc of mesonotum but not deep; sternaui broad and deeply impressed; metathoracic costae somewhat distinct, basal area well defined. Scutellum black; postscutellum rarely flavescent centrally. Abdomen rugulose punctate and black with a purpurascens reflection, and the second to fifth or sixth segments apically flavous: basal segment with distinct lateral costae and the discal carinae subrectangularly declived beyond the centre; second distinctly impressed laterally. Legs either entirely black or with the front femora apically castaneous beneath; hind femora stout and subfusiform. Wings distinctly infumate, the front ones with the costal margin darker; radix and tegulae black, stigma piceous, areolet sessile. Length, 9—11 mm.

Very like *M. micratorius* but with the basal segment and all the legs usually immaculate, a distinct frontal excrescence, etc.; the strongly infumate and apically subnigrescent front wings will instantly distinguish it from the remainder of our indigenous species.

It has not hitherto been recorded from Britain, but was extremely probable to occur here since it is found throughout western Europe, in Sweden, Belgium, France, etc. Its economy is still a moot point: Vollenhoven says (*l. c.* p. 26), "The species described by Hartig is stated by him to have been produced from *Lophyrus Pini*, which assertion was later supposed to be the result of a mistake, but nevertheless curiously coincides with another account, equally doubtful, according to which *M. fuscipennis* Wesm. was bred also from *Lophyrus Pini* by M. van Medenbach de Rooy." Kirchner had also recorded this species from the same host in 1867.

The only known British specimen was captured recently in Devonshire and has been most kindly presented to me by Mr. T. H. Edmonds. It is somewhat abnormal in its great size of 16 mm., in having the epistoma immaculate and the basal segment broadly pale.

4. *dissectorius*, Panz.

Ichneumon dissectorius, Panz. F. G. xcvi. 14. *Metopius dissectorius*, Panz. Krit. Revis. ii. 80; Wesm. Bul. Ac. Brux. 1849, p. 622; Holmgr. Sv. Ak. Handl. 1855, p. 372; Voll. Pinac. pl. xvi, fig. 2; Thoms. Deut. Ent. Zeit. 1887, p. 194, ♂ ♀. *M. sicarius*, Gr. I. E. iii. 291, ♀. *Peltastes dissectorius*, Curt. B. E. 1824, fol. 4; Lep. Enc. Méth. Ins. x. 37, ♀. Var. *P. nigrator*, Lep. Encycl. Méth. 1825, x. 37, ♀.

Head sometimes with the internal orbits, or a juxta-antennal dot and a line below the antennae, narrowly flavous; mandibles apically acute and not emarginate; palpi flavous. Antennae somewhat stout, either entirely ferrugineous or black with the scape flavous-dotted beneath. Thorax sometimes with an obsolete flavous callosity beneath the radices. Post-scutellum very rarely flavous centrally. Abdomen caerulescent or purpurascant black, especially towards its apex, sometimes with a longitudinal discal carina; three basal segments either flavous-margined with the colour centrally interrupted, or as also is very rarely the fifth, with only a small flavous dot in their apical angles; fourth entirely flavous-margined. Legs rarely totally black, but of variable colour; either infuscate castaneous with the coxae darker; or infuscate with the front ones ferrugineous beneath, the hind coxae black and sometimes all the tibiae entirely ferrugineous; or black with the anterior femora and tibiae laterally dark testaceous beneath; or black with the apices of the front femora and tibiae and base of the latter subtestaceous. Hind femora stout and subfusiform, sometimes castaneous or flavous-marked above. Wings distinctly and determinately infumate in the radial and external cubital cells; stigma fulvous or piceous; radix and tegulae infuscate or black. Length, 10—12 mm.

Wesmael says the ♂ not infrequently has the margin of the fourth segment centrally black.

It may be known by the colour of the abdomen and the infumescence of the wings, says Holmgren; and Thomson shows that the latter character distinguishes it from all other species known to him, but *M. fuscipennis*, Wesm., which has the second to fifth segmental margins entirely pale and the head acutely spinate behind the antennae. Lepeletier's *P. nigrator* appears to differ in little but its entirely black antennae and palpi; it was found about Paris and is not known as British.

This species appears to be but little rarer than the last in northern and central Europe, though Holmgren tells us he found it to be very rare in Sweden in the middle of August. It is said by Vollenhoven to be parasitic on the caterpillar of *Symira venosa*; and Gaulle gives *Amphydasis betularia*, Biston, *Ennomos*, *Gonodontis*, *Hygrochroa*, and *Opisthograptis* as its hosts. With us, however, I can find but two records; Curtis says he took a specimen at the end of September, 1822, in North Devon with the four basal segments pale-margined throughout, and received a second, without any locality, of the typical form; and in the Victoria History, Harwood vaguely records it from Essex. I myself have seen no indigenous examples, though the two specimens in the National Collection from Stephens', and one from Desvignes', collections purport to be such.

5. *peltator*, Marsh.

Metopius peltator, Marsh. Ent. Ann. 1874, p. 130; Voll. Pinac. pl. xvii, figg. 1 et 1a, ♀.

Head with the facial shield narrowly flavous laterally and above; palpi black. Antennae unicolourous black. Thorax black sometimes with a short flavous line before the radices. Scutellum apically flavous, depressed and sinuate with the angles prominent, deplanate and obtuse. Abdomen black and not caerulescent, dull and rugose, becoming smoother apically with the pygidium punctate and subnitidulous; first segment flavous with its base and a central longitudinal line black; second with the apical angles alone flavous; apical margin of the discally subcarinate third to sixth segments concolorous, that of the fifth narrower and of the sixth linear. Legs flavous with femora except at base and apex, and the coxae, black; hind tarsi infusate. Wings fulvescent with the costa a little darker, and the radial with external cubital cells subdeterminately infumate; tegulae black; radix and stigma fulvous. Length, 15—17 mm.

Marshall, who erred in supposing the two basal segments to be one, points out that *M. dissectorius* is the only previously known British species of this genus with distinctly infumate wings, and that this has the abdomen caerulescent with the basal fasciae never centrally complete as in the present species; this he considers most closely allied to *M. fuscipennis*, Wesm.

I saw the type specimen of this species in the late Dr. Mason's collection in Sept., 1900; it is labelled "Milford on whitethorn blossoms, June 1, 1866." Marshall writes: "Found in a wood of young oaks near Milford Haven, in May, settling on blossoms of the whitehorn" (Marshall, *l.c.*); and it is now in the National Collection. I also possess a single small ♀ captured by the late Mr. A. J. Chitty, in the New Forest, in June, 1893.

TRIBE

SPHINCTIDES.

Face deplanate; antennae stout and subfiliform. Metathorax short, subvertical, with the areola obsolete or strongly transverse and petiolar area very large; spiracles minute and circular. Scutellum large, deplanate, strongly margined and sometimes hardly discreted from mesonotum. Abdomen dull and strongly punctate, elongately petiolate with prominent spiracles in centre of basal segment; second segment not discally carinate. Legs slender; hind tibiae unicalcarate, the intermediate bicalcarate. Areolet sessile, triangular and not large, its inner nervure oblique and the outer subcontinuous with the straight recurrent nervure; submedian longer than the median cell; nervellus subopposite and intercepted but very slightly below its centre.

This tribe is abundantly distinct in the peculiar conformation of its areolet, the strongly petiolate pyriform abdomen, margined scutellum, subvertical metathorax and tibial calcaria. It is known to prey upon subapodous Lepidopterous larvae. But one genus containing a single species has been described from the palearctic region, though a second was brought forward, in ignorance of its true position, by Cameron in 1899.

SPHINCTUS, *Gravenhorst*.

Grav. I. E. ii. (1829), 363; *Eradha*, Cam. Manch. Mem. 1899, p. 213.

The characters are those of the tribe and the peculiar facies extremely distinct.

1. *serotinus*, *Grav.*

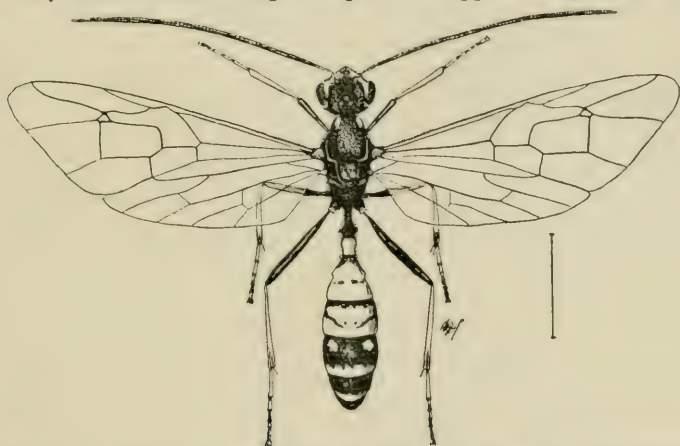
Sphinctus serotinus, Gr. I. E. ii. 365; Hartig, Arch. f. Naturg. 1837, p. 155, pl. iv, figg. 5 et 7; Blanch. Hist. Ins. iii. 310; Ratz. Ichn. d. Forst. ii. 119; iii. 131; Brisch. Schr. Nat. Ges. Danz. 1878, p. 114, ♂ ♀.

A black and flavous species, closely punctate with griseous pilosity. Head short and strongly transverse, with the facial orbits broadly and the external narrowly flavous. Antennae entirely black, or more or less broadly ferrugineous basally especially beneath, strongly incrassate and basally attenuate. Thorax subglobose; subhamate marks on either side of mesonotum, propleurae above and dots on both meso- and metapleurae, flavous. Scutellum large, subquadrate and deplanate, with two often coalescent apical flavous dots. Abdomen stout and pyriform, with basal segment scabrous and sublinear; second and third except basally with two discal dots, first and fourth and fifth at their apices, flavous; remainder black; terebra very short. Legs slender and not elongate, black with the tibiae, apices of all the femora and the hind coxae above, flavous. Wings narrow, subhyaline with the anterior margin infumate beyond the narrow and fulvous stigma. Length, 10—14 mm.

This species is termed *serotinus* because Klug first took it flying in the autumn, near Berlin; subsequently it was found in Germany among hazel bushes in September; Italy (Grav.); Austria (Kirchner); Brischke found the female in Prussia as late as 6th October; and it has been added to the French fauna (Gaulle, 1908) since the publication of Dours' Cat. in 1874. Giraud tells us (Fr. Soc. 1877) that he bred it from *Heterogena testudinana* in Hungary; and Ratzeburg had already recorded it from the

same host. He describes the cocoon thus: "Der Cocon, in der Form eines Lophyren-Tönnchens, hat 3^{mm} Länge, ist rothbraun und sehr fest. Das neben demselben liegende Thier lag noch in dem gekrümmten Zustande einer Puppe. Die Färbung war zwar schon so ausgeprägt, dass man die Species erkennen konnte; jedoch war die Farbenvertheilung höchst eigenthümlich; das Schwarz prävalirta mehr als bei den entwickelten Stücken unserer Sammlung, indem man vom 3ten Ringe an mehr Schwarz als Gelb bemerkte. Es entstanden ähnliche schwarze Querbinden, wie bei *Metopius*." This exactly agrees with a cocoon given me, together with its imago, by Dr. Chapman, who bred it on 25th August, 1901, from a German specimen of *Limacodes Testudo*. The egg is curiously petiolate, and has been described by Dr. Hartig (*l.c.*)

It was not known as British to Westwood in 1840, though recorded by Desvignes in 1856 on the strength of three examples, still in the National Collection, taken by Dr. Leach "in the west of England." That the latter only knew it from Ingall's specimen appears improbable, since



Ingall says, in putting his "Capture of *Sphinctus serolinus* of Gravenhorst" on record (*Zoologist*, xiv, 1856, p. 5326) that he beat "a single specimen of this, one of the very rarest of our Ichneumonidae, out of an oak tree in Wickham Wood," about the middle of September, 1856, and he would certainly have given it as new to Britain if such were the case, since Fred. Smith named it. Smith refers to the above capture (*Ent. Ann.* 1857, p. 33), gives the exact date as September 13th, and adds that "it appeared very sluggish and made no attempt to escape. Although diligent search was made a second example could not be found. . . . Only a few specimens have occurred in this country." In spite of these few, Marshall regarded it as doubtfully British in 1872 (*Trans. Ent. Soc.* p. 264). That it is rare with us is certain—its single host is by no means common—but it is now well authenticated as British. Bridgman named both sexes, bred by W. H. B. Fletcher, presumably at Worthing, towards the end of September, and for the third time, raised the Braconid, *Pelecystoma lutea*, Nees, from the same host (*E. M. M.* 1889, p. 433, where hyperparasitism is suggested). Another indigenous example is in my collection and was captured in the Blean Woods in Kent, in 1898, by the late A. J. Chitty.

TRIBE

EXOCHIDES.

This extremely interesting and distinct tribe is at once known from the whole remaining Ichneumonidae by the strongly protuberant face, the side view of which is amazingly similar to that of a rhinoceros, and the very stout legs. Besides the standard works of Gravenhorst and Holmgren, we have capital monographs of the Exochini by Holmgren in the Ofv. of 1873 and by Thomson in the Deut. Ent. Zeit. 1887; but the Orthocentrini is one of the least worked groups of the Ichneumonidae, on account of the small size and extreme similarity of its species, and Gravenhorst knew practically nothing of it, though Holmgren described some fifty species in 1855 and was ably, though somewhat too concisely, supplemented by Thomson in the last fasc. of his Opusc. Ent. I have found but little difficulty, though immense and close labour, in working out our indigenous species of this tribe, which numbered only thirty-seven at the time of the appearance of our last British catalogue, but has now risen to seventy-five indigenous kinds.

The Orthocentrini have been raised to a tribe of equal dignity with the Exochides, but they are so undeniably closely allied that this is, I think, incorrect. They, moreover, provide an entirely natural link between the Tryphoninae and Ophioninae, since in many respects they are even more closely allied to the Plectiscides than to the Exochini, and care must be exercised not to confuse members of the former with them.

Table of Sub-tribes.

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|------|---|----------------|
| (2). | 1. Scape not cylindrical; femora subglobose; 1st seg. often shining | EXOCHINI. |
| (1). | 2. Scape cylindrical; femora simply stout; 1st seg. always scabrous | ORTHOCENTRINI. |

SUB-TRIBE

EXOCHINI.

Table of Genera.

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|------|--|------------------------------|
| (2). | 1. Metanotum with no carinae; abdomen mainly flayous | COLPOTROCHIA, <i>Holmgr.</i> |
| (1). | 2. Metanotum with strong carinae; abdomen not mainly pale. | |
| (4). | 3. Abdomen scabriculously punctate, dull; 2nd seg. carinate | CHORINAEUS, <i>Holmgr.</i> |
| (3). | 4. Abdomen nitidulous and subglabrous; 2nd seg. not carinate. | |
| (8). | 5. Notauli entire to disc; basal segment not glabrous. | |
| (7). | 6. Antennae long and complex; metanotum and petiole rugulose | HYPERACMUS, <i>Holmgr.</i> |
| (6). | 7. Antennae short and simple; metanotum and petiole smooth | MICROLEPTES, <i>Grav.</i> |

- (5). 8. Notauli punctiform; basal segment subglabrous.
 (10). 9. Head vertically declived immediately behind the eyes POLYCLISTUS, Först.
 (9). 10. Head much broader behind the eyes.
 (12). 11. Antennae subclavate; hind tibiae unicalcarate PERIOPE, Hal.
 (11). 12. Antennae filiform; hind tibiae bicalcarate EXOCHUS, Grav.

COLPOTROCHIA, Holmgrén.

Holmgr. Sv. Ak. Handl. 1854, p. 80.

Head transverse with a posteriorly elevated interantennal cristula; vertex and face convex and the latter somewhat protuberant; clypeus not discreted; mandibles basally broad, apically curved and constricted with the teeth subequal in length; eyes oblong and distinctly emarginate next the scrobes. Antennae filiform, stout, apically attenuate and hardly shorter than the body. Thorax stout, notauli wanting, epicnemium entire; pronotum excavate, with distinct epomia; metathorax with the discal areae wanting and the basal but indicated; spiracles elongate and parallel-sided. Scutellum not bordered. Abdomen ovate-fusiform, sessile, nitidulous and pilose; first segment gradually a little constricted basally, with the carinae inconspicuous and not extending to its central spiracles, beyond which it is immarginate; segments two to beyond centre of four laterally margined, with broad epipleurae; terebra concealed. Legs stout, with femora incrassate. Areolet wanting, radius apically strongly sinuate, second recurrent almost continuous with submarginal nervure; nervellus intercepted below its centre.

At once known from all other Exochid genera by the absence of discal metathoracic areae and its broadly flavous abdomen. The areolet is extremely rarely entire, very small and elongately petiolate. The genus is probably confined to single species both in Europe and India, since the two described by Vollenhoven (I have his *C. affinis* from Comano Vlasca in Roumania and find no specific distinction) and Rudow seem hardly more than forms of our own species, known to be indigenous since the time of Stephens. *Tryphon Scolicus* is not a member of this genus, as was supposed by Marshall and Dalla Torre.

1. *elegantula*, Schr.

Ichneumon mandator, Linn. S. N. ed. x, 565; Fab. M. I. 266; *Cryptus mandator*, Fab. Piez. 86; *Anomalon mandator*, Jur. Nouv. Méth. 116 (?). *Ichneumon elegantulus*, Schr. En. Ins. Austr. 361; Gr. Mem. Ac. Tor. 1820, p. 375, ♂. *Tryphon elegantulus*, Gr. I. E. ii. 235; Fonsc. Ann. Soc. Fr. 1849, p. 225, ♂. *Colpotrochia elegantula*, Holmgr. Sv. Ak. Handl. 1855, p. 307, ♀; Ofv. 1873, p. 56; Voll. Pinac. pl. viii, fig. 1; Thoms. Deut. Ent. Zeit. 1887, p. 199; Buysson, Revue Ent. 1892, p. 258, ♂ ♀.

A shining black species with the abdomen centrally and most of the legs bright flavous. Head black with an elevated carina between the antennae; genal costa elevated; palpi infusate. Antennae nigrescent, becoming ferrugineous beneath, with the scape more or less broadly flavous. Thorax stout and black with grey pilosity, in ♂ pale-marked; metathorax more sparsely punctate with the spiracular and supracoxal

areae entire but with the discal obsolete and petiolar incomplete, though laterally indicated. Scutellum black, subdeplanate and sparsely punctate. Abdomen a little longer than head and thorax; basal segment narrow, convex, punctulate and basally sulcate, with spiracles slightly before its centre; second longer than broad and the anus pilose. Legs with the coxae, trochanters and femora black; front femora beneath and the intermediate apically, the tibiae except extreme base and apex of hind ones, bright flavous; tarsi fulvous, with their claws strongly curved. Wings subhyaline, with no areolet; stigma nigrescent, tegulae concolorous with margin pale; radial nervure curved at base and apex. Length, 11 mm.



It is wide spread on the Continent through Italy and Germany (Grav.), France (Fonsc.), Holland (Voll.); it has been bred from *Leucania turca* in Austria (Giraud, Ann. Soc. Fr. 1877, p. 408); and in southern Sweden, where he regarded it as of very rare occurrence from the middle of July to the middle of August, Holmgren noticed its predilection for shady situations. In Britain Stephens thought it "very rare, and variable; found in June near London"; it is recorded from Lands End (Marquand); a single specimen at Bickleigh in Devon in the middle of September (Bignell); and "common" in Norfolk (Bridgman). I fancy Bridgman has exaggerated its frequency, however, since I have seen but three females from the Forth district of Scotland, two of which were captured at Aberfoyle on 27th July, and the other on 13th of the same month at Forest Mill (Evans, Ann. Scot. Nat. Hist. 1902, p. 57); and I possess but single specimens from Norwich (ex coll. Beaumont) and Shere in Surrey (ex coll. Capron). Dr. Leach took it in the West of England.

CHORINAEUS, *Holmgren*.

Holmgr. Sv. Ak. Handl. 1855, p. 320.

Head transverse and not buccate; face not at all strongly protuberant; vertex narrow and subtruncate; interantennal process very short; clypeus imperfectly discreted, with its lateral foveae deeply impressed; oral costa not or hardly elevated; cheeks nitidulous and not sulcate; eyes hardly or very broadly emarginate. Antennae somewhat slender, subsetaceous with the scape not curved. Thorax stout; pronotum entirely glabrous, with epomiae hardly indicated above; notauli entirely wanting and epicnemial entire; metathorax nitidulous and subglabrous with the spiracles small and subcircular, the longitudinal carinae strong but the transverse ones, except rarely the costulae, wanting; basal area confluent with the areola, as is also nearly always the very short petiolar. Scutellum neither small nor convex, usually completely margined, its basal fovea also bordered and not broad. Abdomen oblong-fusiform and somewhat curved with the epipleurae inconspicuous; ♀ with six and ♂ with seven strongly and, towards the base, subscabridously punctate dorsal segments; first always bicarinate throughout; second and sometimes third usually with one or three longitudinal carinae; terebra slender, acuminate and concealed. Legs stout with the unguis and unguiculi not slender; intermediate calcaria more or less unequal in length. Wings with areolet wanting; first discoidal cell apically acute below; fenestrae small; lower basal nervure oblique, usually subcontinuous with the upper, very rarely strongly postfurcal; nervures of hind wing apically obsolete, nervellus strong, oblique and antefurcal.

This genus differs from the remainder of the Exochides in its scabridously punctate abdomen, with the second and third segments usually carinate. Stephens knew three British species in 1835; Haliday described a fourth, still unknown on the Continent, in 1839; and Bridgman found a new kind in 1881, subsequently also brought forward by Thomson under a distinct name in Sweden. Capron detected another Scandinavian kind here in 1888; and I find yet another to be common with us. Four other species have been recognised by Thomson in Sweden and are by no means unlikely to occur with us. Elsewhere the genus appears to be restricted to northern America, where Cresson, Walsh and Davis have found a dozen species; and to New Zealand, whence two more are known. The indigenous kinds are not very distinct *inter se* and care is necessary for their correct discrimination.

Table of Species.

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|-------|----|---|----------------------------|
| (10). | 1. | Basal segment strongly bicarinate,
second also distinctly carinate. | |
| (9). | 2. | Intermediate calcaria but slightly
unequal; second segment uni-
carinate. | |
| (8). | 3. | Smaller; antennae shorter; cheeks
normal. | |
| (7). | 4. | Lower basal nervure subcontinuous;
hind tibiae basally white. | |
| (6). | 5. | Anterior coxae pale; face entirely
flavous | 1. CRISTATOR, <i>Grav.</i> |

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|-------|-----|--|------------------------------|
| (5). | 6. | Anterior coxae black; female face centrally black | 2. FUNEBRIS, <i>Grav.</i> |
| (4). | 7. | Lower basal nervure postfurcal; hind tibiae all flavous | 3. FLAVIPES, <i>Bridg.</i> |
| (3). | 8. | Larger; antennae longer; cheeks buccate | 4. LONGICORNIS, <i>Thom.</i> |
| (2). | 9. | Intermediate calcaria of very unequal length; second segment tricarinate | 5. TRICARINATUS, <i>Hlm.</i> |
| (1). | 10. | Basal segment weakly bicarinate, second with no trace of carinae. | |
| (12). | 11. | Legs mainly black, hind tibiae basally pale | 6. TALPA, <i>Hal.</i> |
| (11). | 12. | Legs red, with only the hind coxae partly black | 7. ASPER, <i>Grav.</i> |

1. *cristator*, *Grav.*

Exochus cristator, Gr. I. E. ii. 352; Steph. Illus. M. vii. 267, ♂ ♀. *Chorinaeus subcarinatus*, Holmgr. Sv. Ak. Handl. 1855, p. 321, ♂. *C. cristator*, Holmgr. Ofv. 1873, p. 78; Brisch. Schr. Ges. Kön. 1871, p. 101; Schr. Nat. Ges. Danz. 1878, p. 108; Voll. Pinac. xxxviii, figg. 3 et 4; Thoms. Deut. Ent. Zeit. 1887, p. 200, ♂ ♀.

Head black and posteriorly not narrower than the internally broadly emarginate eyes; face, the normally broad cheeks, and the mouth except apices of the bidentate mandibles, flavous; face prominent and finely punctate, frons nitidulous and centrally impressed. Antennae filiform and not longer than half the body, rufescent beneath; basal flagellar joint longer than broad and hardly longer than the second. Thorax stout, black and nitidulous, as broad as the head and not very closely punctate; notauli wanting; pleurae shining and finely punctate; metathorax subglabrous with two strong and parallel longitudinal discal carinae, apically connected with two more on either side which include the small and circular spiracles. Scutellum large, deplanate, sparsely punctate and bordered throughout, with its base truncate. Abdomen nearly double length of head and thorax, broader behind centre, discally black with venter ochraceous; all the segments dull and scabriculously punctate, with elongate griseous pilosity; basal segment strongly bicarinate and laterally margined; second, and often third, with a single discal carina; terebra very slender and concealed beneath pygidium, ♂ cerci somewhat prominent. Legs short, stout and fulvescent with the anterior coxae and trochanters, and extreme base of the hind tibiae, flavous; apices of tarsi and the hind coxae nigrescent; intermediate calcaria of equal length. Wings hyaline with no areolet; stigma and tegulae rufescent; radial nervure short and evenly curved; first discoidal cell apically acute; basal nervure strongly curved and continuous through the median; radius of hind wing obsolete beyond recurrent nervure; nervellus obsoletely intercepted but slightly below its centre and subantefurcal. Length, 5—6 mm.

The ♀ often has the segments apically rufescent; the pedal colouration is variable, since the intermediate femora are sometimes infuscate beneath, and the hind ones often apically and sometimes also both above and below black.

This species is known from Germany, Sweden, France, and Lapland (*cf.* Roman, Nat. Unt. Sarek. 1909, p. 350). It is our commonest

species. Taken in June, near London, and in Salop (Stephens); common in Norfolk and bred by Atmore at King's Lynn from *Tortrix decretana* (Bridgman); Walkham Valley, Devon, in early June (Bignell); Harting in Sussex, in August, and three at Blackheath in June, 1899 (Beaumont); Shirley (Champion) and Shere, in Surrey (Capron); Wimbledon in May (Stenton); Guestling, near Hastings (Bloomfield); Felden in Herts (Piffard); bred from a birch branch, on 21st May, at Bristol (Charbonnier); bred at Timworth in West Suffolk in 1909 (Col. Nurse). It has occurred to me upon willow, the flowers of *Heracleum sphondylium*, etc., from the 6th of June to the middle of September at Burgh Castle, Tuddenham Fen, on the coast at Covehithe and Walberswick in Suffolk, and at Philips' Hill at Lyndhurst in the New Forest: but I know nothing further respecting its economy. Both this and the next species are said by J. T. Schreiner (Trd. b. Ent. 1907, p. 15) to prey upon *Hyponomeuta malinella* in Russia; and I have a female bred from *Nothris Durdhamella* by C. G. Barrett in Britain.

2. *funnebris*, Grav.

Exochus funnebris, Gr. I. E. i, Suppl. 695: Steph. Illus. M. vii. 268, ♂ (sic). *Chorinaeus funnebris*, Holmgr. Sv. Ak. Handl. 1855, p. 321; Ofv. 1873, p. 78, pl. ii, fig. 11; Brisch. Schr. Ges. Kön. 1871, p. 101; Schr. Nat. Ges. Danz. 1878, p. 108; Thoms. Deut. Ent. Zeit. 1887, p. 201, ♂ ♀.

A black species with the legs flavous-marked, the antennae short and clypeus subdiscreted. Length, 5—6 mm.



Gravenhorst only knew two females, which he regarded as probably males, and thought this species hardly more than a variety of the last. But Thomson (*loc. cit.*) points out that, although the size, outline and antennal structure are the same, the legs are darker, the facial flavescence extends only to slightly above the scrobes, the front coxae are black and

apices of their trochanters alone flavous, the intermediate legs are black with the trochanters, femoral apices, tarsi and tibiae pale, and the hind tibiae are nigrescent with their base alone pale. It is, too, a much more strongly nitidulous insect with the ♀ abdomen apically subtruncate, having the fifth and not the fourth segment the broadest.

Nevertheless the records are much mixed and many doubtless refer to the last species.

It has been noted in Lapland, Sweden, Germany, and France. In Britain I consider it rare; Netley in Shropshire, taken by Hope (Gravenhorst); June, near London (Stephens); common in Norfolk and bred by W. Fletcher from *Eupaccilia angustana* (Bridgman); near Carlisle in July (Routledge); swept towards the end of May, 1907, at Foxhall in Suffolk (Chitty); Box Hill early in June, 1906 (Newbery); Hastings in early June, 1907 (Butterfield). I took a female by sweeping at Matley Bog in the New Forest, in the middle of June, 1907. Bignell says (Trans. Devon. Ass. 1898, p. 499) that he has bred it on 10th February from (doubtless forced) *Depressaria heracleana* and taken it at Bickleigh Woods at the end of June and the beginning of August. Marshall found it at Bishops Teignton, Govilon, Nunton, Botusfleming, Cornworthy; and Pascoe in the New Forest in September.

3. *flavipes*, Bridg.

Chorinaeus flavipes, Bridg. Trans. Ent. Soc. 1881, p. 165, ♂. *C. brevicarcar*, Thoms. Deut. Ent. Zeit. 1887, p. 201, ♂ ♀.

A black species with all the tibiae entirely stramineous, the flagellum ferruginous and lower basal nervure strongly postfurcal. Length, 6 mm.

Very similar to *C. cristator* in size and conformation, but the thorax is more nitidulous and sparsely punctate, the antennae are entirely ferruginous, the basal nervure is not continuous through the median, the more coarsely punctate abdomen is never red banded and has stouter carinae, the hind femora are black with their extreme apices alone rufescent, the metanotal apophyses are stronger, the calcaria obviously shorter and the apical is longer than the second hind tarsal joint.

No doubt can, I think, remain respecting the above synonymy, not previously noted.

Thomson found this species in southern Sweden, and Bridgman a single individual near Norwich in August, 1878; subsequently (Trans. Norf. Soc. 1893, p. 628) he says, "I took a single specimen on Mousehold in August, 1872," but the latter year must be a misprint. It is probably much mixed with the preceding; I have three examples of each sex in Capron's collection from Shere in Surrey, and a ♀ which was "bred on May 31st, 1903, from *Salebria formosa*, Haw., at Ashford in Kent; E. R. Banks." Harwood found a couple at Colchester in 1904.

4. *longicornis*, Thoms.

Chorinaeus longicornis, Thoms. Deut. Ent. Zeit. 1887, p. 201, ♂ ♀.

A black species with the legs except basally red, the ♀ antennae distinctly longer than half the body and those of the ♂ hardly shorter than the whole insect. Length, 7 mm.

This species is the largest of the genus and differs from all the preceding in its buccate cheeks, longer frontal flavous markings, the distinctly longer antennae which are infusate with the under side ferrugineous, and in the somewhat elongate calcaria.

It has hitherto been overlooked and not recorded from Britain, but it is by no means uncommon with us. Thomson found it in southern Sweden and Gaulle records it from France. Ashby near Doncaster, early in June, 1900 (Cassal); Treswell Wood, Notts, early in June, 1900 (Thornley); Cornworthy in Devon (Marshall); Wyre Forest on 16th April, 1895 (Martineau); Shere in Surrey (Capron); Guildford in August, 1900 (Butler); Felden in the middle of June, 1901 (Piffard); Ewhurst in Sussex, early in September, 1898 (Esam); Finborough Park, Suffolk, on *Angelica* flowers at the end of August (Tuck). I have found it in the Bentley Woods in the middle of June and in the marshes at Henstead in the same county at the end of August, 1898.

5. *tricarinatus*, Holmgr.

Chorinaeus tricarinatus, Holgr. Sv. Ak. Handl. 1855, p. 321; Ofv. 1873, p. 77, pl. ii, fig. 12; Brisch. Schr. Ges. Kön. 1871, p. 101; Schr. Nat. Ges. Danz. 1878, p. 108; Voll. Pinac. pl. xxxviii, fig. 2; Thoms. Deut. Ent. Zeit. 1887, p. 202, ♂ ♀.

A black species with the second segment tricarinate, the legs partly red and the face dull flavous. Head black with the face somewhat dull and closely punctate, with the flavescence not extending above the scrobes; eyes internally hardly emarginate. Antennae ferrugineous, of ♀ hardly and of ♂ but slightly longer than half the body. Thorax black; prothorax with no impression next the dorsal suture; metanotal costulae stout or wanting; dentiparal areae apically produced. Abdomen nitidulous with the three carinae of the second segment elongate, and of the third short. Legs red or infusate; intermediate calcaria strongly unequal in length; femora somewhat stout. Length, 5—6 mm.

The tricarinate second segment renders this species abundantly distinct, though two others with similar modifications have been described on the Continent.

It is recorded from Lapland (Holmgren), Sweden as bred from *Hyponomeuta padella* (Thomson) and in Austria from the same host (Giraud); in France it is also bred from *H. malinella* and *H. 20-punctata* (Gaulle). It was first noticed as British by Dr. Edward Capron and introduced (E.M.M. 1888, p. 217) on the strength of several examples of both sexes, taken at Shere in Surrey during the previous year; though single examples existed in both Stephens' and Desvignes' collection. These are now in my collection, together with a female captured at Felden in Herts (Piffard) and both sexes bred with *Triclistus spiracularis*, Thoms. and *Microgaster tibialis*, Nees, on "May 20th to June 4th, 1898, from larvae of *Depressaria scopariella*, Hein., received from Colchester in July, 1897" (Banks). I have invariably found it in very marshy places: on *Angelica* flowers at Harkstead early in September, by sweeping in Tuddenham Fen at the end of August, and at Sutton Bridge in Lincs. in the middle of the same month on reeds.

6. *talpa*, Hal.

Exochus Talpa, Hal. Ann. Nat. Hist. 1839, p. 113, ♂ ♀. *Chorinaeus talpa*, Thoms. Deut. Ent. Zeit. 1887, p. 202, ♂ ♀. *C. asper*, var., Bridg. Trans. Ent. Soc. 1881, p. 165, ♂ ♀.

A small, black species, with the antennae of ♀ not longer than the thorax and of ♂ extending to apex of the fourth abdominal segment. Scutellum immarginate. Abdomen black and basally scabriculous. Legs black with only the front tibiae and tarsi ferrugineous, and the posterior tibiae basally white. Wings with no areolet; the lower basal nervure postfurcal; nervures of hind wings apically wanting; nervellus geniculate but not intercepted. Length, 3—3½ mm.

At once known by its small size, immarginate scutellum, the mainly black legs and entire absence of all carinae on the second segment.

Ireland in April and May (Haliday); England (F. Walker); bred by Elisha from *Gracillaria semifascia* (Fitch, Entom. 1883, p. 67). As far as one can judge by the description of the former, *C. asper*, Grav., differs from this insect only in the pedal coloration and no doubt can be entertained that Bridgman's "var. Legs piceous" of it is referable to the present species; both sexes of this form were taken during the same months as Haliday's examples, but in 1880 near Norwich; and subsequently (Trans. Norf. Soc. 1893, p. 628) Bridgman tells us that the present species is common in Norfolk, while making no mention of *C. asper*. Elsewhere it is only known in southern Sweden; and has nowhere been more recently bred. Stenton took it on 11th May, 1911, at Wimbledon; Tuck on 21st April, 1900, at Tostock in Suffolk; Capron at Shere and Piffard at Felden, in Herts.

7. *asper*, Grav.

Exochus asper, Gr. I. E. i., Suppl. 694; Steph. Illus. M. vii. 267.

Head black with the mouth ferrugineous. Antennae a little longer than half the body, rufescent towards the base beneath. Thorax black. Abdomen as long and as broad as head and thorax; first segment a little constricted basally, longer than broad, scabriculous and longitudinally bicarinate; the following becoming gradually shorter and smoother. Legs pale red, with the hind coxae alone basally black above. Wings hyaline; stigma and costa piceous, radix and tegulae flavous. Length, 3½ mm.

Marshall, no doubt correctly, placed this species in the present genus in his Catalogue, but we know nothing of it beyond the original description and it is unknown on the Continent. I have seen nothing like it, but am inclined to consider it distinct from *C. talpa* on account of the red legs, which appear constant in colouration.

One individual of uncertain sex was taken by Hope around Netley and constitutes the type, (which is very probably in the Hope Department of the Oxford Museum), as recorded by Gravenhorst; and Stephens informs us, unreliably, that it has also been found near London in the month of June.

HYPERACMUS, *Holmgr.*

Holmgr. Sv. Ak. Handl. 1855, p. 322; *Nothaima*, Cam. Journ. Bombay N.H. Soc. 1902, p. 428.

Head transverse, with the vertex emarginate and face strongly protuberant; interantennal carina entirely wanting; clypeus deplanate and but obsoletely discreted; eyes not emarginate. Antennae stout, with the scape subcylindrical; flagellum filiform, of ♂ as long as the body and apically attenuate with the joints elongate and the fifth basally emarginate, of ♀ short with the joints subtransverse and externally subdentate. Thorax deplanate, with the epomia wanting and epicnemial entire; notauli very distinct and extending to centre of mesonotum; metathorax somewhat convex and rugulose with obvious longitudinal but no transverse costae; petiolar area subobsolete. Abdomen of ♀ oblong-ovate, of ♂ subcylindrical; basal segment rugulose, gradually constricted basally and laterally immarginate, with spiracles slightly before the centre; remaining segments transverse and nitidulous. Legs subincrassate and not very short, with the tibiae externally setiferous and calcaria curved. Wings narrow and somewhat elongate; areolet wanting; nervellus intercepted below its centre.

The strongly deplanate and nitidulous mesothorax and abdomen, and the peculiar conformation of the antennae of both sexes, will instantly distinguish this genus, which is somewhat allied to *Lampronota*.

1. *crassicornis*, *Grav.*

Exochus crassicornis, Gr. I. E. ii. 347, ♀. *Hyperacmus crassicornis*, Holmgr. Sv. Ak. Handl. 1855, p. 322, ♀; Brisch. Schr. Ges. König. 1871, p. 101; Schr. Nat. Ges. Danz. 1878, p. 108; Thoms. Deut. Ent. Zeit. 1887, p. 199, ♂ ♀. *Nothaima bicarinata*, Cam. l.c.

A strongly shining black species with palpi pale, the mouth, underside of antennae and most of the legs castaneous. Head somewhat tumidulous, with vertex emarginate and face smooth; frons somewhat convex and centrally canaliculate. Thorax stout with the metathorax scabrous and bicarinate throughout; spiracles oval and not small. Abdomen black or sometimes mainly badius; basal segment laterally nearly straight, dorsally scabriculous with basal weak carinae extending to the spiracles, which are a little before the centre and not prominent; remaining segments strongly shining. Legs castaneous with the anterior, especially in ♂, paler; all the coxae and the hind trochanters black. Wings hyaline with the tegulae, radix and stigma piceous; radial cell somewhat narrow. Length, 7—9 mm.

This is an uncommon species both in Sweden and central Europe. It was introduced as British by Bridgman (Trans. Ent. Soc. 1882, p. 101) on the strength of a female taken at Shere in Surrey by Dr. Capron, and the latter records both sexes from the same locality by sweeping rough grass under trees on 3rd September (Entom. 1883, p. 240). These three specimens are now in my collection, together with a fourth captured at Shirley on 20th August, 1904, by Mr. Ernest Bedwell. I have examined examples from India.

MICROLEPTES, Gravenhorst.

Gr. I. E. i, Suppl. 679.

Head subglobose; face protuberant. Antennae incrassate, short and simple; scape not cylindrical. Notauli entire to disc of mesonotum; metanotum not rugulose, with strong carinae. Abdomen stout, petiolate, black, nitidulous, not scabriculously punctate; basal segment neither glabrous nor rugulose; second segment not carinate; terebra concealed. Legs incrassate. Areolet wanting.

I have attempted to place this genus, which has been neglected since first erected. The above characters will distinguish it from all other Ichneumonidae.

1. splendidulus, Grav.

Microleptes splendidulus, Gr. I. E. i, Suppl. 679; Ste. Ill. M. vii. 211, pl. xl, fig. 3; Brullé, Hist. Nat. Ins. iv. 313; Blanch. Hist. Nat. Ins. iii. 306; Voll. Schets. I, pl. i, fig. 6; cf. Bridg.-Fitch, Entom. 1882, p. 84 et Morl. loc. cit. 1910, p. 174.

A strongly nitidulous black species with the antennae very short, and both legs and scape conspicuously pale. Head cubical and nearly glabrous, with temples as broad as the entire and somewhat small eyes; frons



strongly concave, and apically carinate in the centre; face glabrous, nitidulous, distinctly transverse, and prominent above; clypeus small, and only laterally discreted; mandibles very large, strongly punctate, nearly as broad as eyes, and testaceous; the exerted labrum and very slender palpi stramineous; cheeks strongly buccate and very broad, apically margined, subproduced above, and smooth with a few large and scattered punctures. Antennae stout, nigrescent and hardly extending beyond radices; radicula, scape, pedicellus entirely, and the flagellum basally beneath, testaceous; scape very large, twice longer than broad, glabrous,

subcylindrical and apically truncate; pedicellus glabrous and circular; flagellum of fourteen moniliform and strongly setiferous, transverse joints, of which the basal alone is cylindrical and half as long again as apically broad. Thorax deplanate, immaculate, subglabrous and strongly nitidulous, with distinct and elongate notauli; mesosternum deplanate and not discreted from their pleurae, both glabrous; metathorax convex, finely scabriculous and apically truncate, with strong costae; areola large, coalesced with basal area, apically rounded and entire; costulae short and entire; supracoxal areae subproduced laterally; spiracular areae smoother, subconcave, with the circular spiracles facing upward; petiolar area trans-striate, discreted and about half length of areola. Scutellum deplanate, glabrous and not margined. Abdomen deplanate, fusiform and glittering black, with short and sparse white hairs; basal segment petiolate and gradually explanate throughout, discally bicarinate to the densely acuminate apex, glabrous between carinae, with obsolete spiracles very slightly beyond its centre; second segment as long as its apical breadth, with distinct thyridii; anus subcompressed, with the eighth segment stramineous and terebra not exerted. Legs short and somewhat stout, entirely pale testaceous, with only the hind coxae darker basally above, and the front femora distinctly incrassate; coxae deplanate beneath; claws elongate, very slender and simple; basal joint of front tarsi strongly arcuate; intermediate calcaria of subequal length; external hind calcar nearly as long as breadth of their tibial apex. Wings hyaline, somewhat narrow and not ample; radix, tegulae, the triangular stigma and the nervures, testaceous; areolet wanting, basal abscissa of radius very short and emitted from centre of stigma, the apical subreflexed; intercubital nervure distinct and as long as space between it and the xfenestrate second recurrent; basal nervure curved and exactly continuous through the median. Nervures of hind wings with the apical, and the strongly sinuate median basally, obsolete; nervellus antefurcal and not intercepted. Length, $5\frac{1}{2}$ mm. ♀ only.

This description, drawn from two females taken by Desvignes, in the British Museum, agrees very well with the short one of Gravenhorst except in the number of antennal joints, which he computes as "circiter 22"; but only nineteen are figured by Westwood in Steph. Illus. 1835, pl. xl, which may represent the ♂ of the present insect, though the basal segment is not explanate throughout, the notauli are wanting and nervellus is strong. Brullé first suggested vaguely some analogy with *Evochus* in 1846 and Desvignes placed his females in that section about 1860, though in his Cat. of 1856 he left it, as placed by Gravenhorst, next after (misprinted synonymous with) *Brachypterus*. Blanchard and Westwood add nothing to our knowledge; and Bridg.-Fitch in 1882 are satisfied to leave it in the division of the *Ichneumoninae*, for which Marshall had erected the name *Microlepti* in 1872; Berthoumieu, yet more vaguely, relegates *Microleptes* to the *Tryphoninae* (cf. Ichm. Brit. i. 291).

Of this exclusively British species, Hope sent Gravenhorst a single specimen from Netley in Shropshire; Stephens writes: "Found at Charlton in August"; and Desvignes found the two females here described, which Bridg.-Fitch mistook for Stephens' capture. Prof. Poulton is good enough to tell me that not even a pin-hole adorns the space left by Westwood for this species in Hope's collection, at Oxford; so it is extremely improbable that Stephens' figure was drawn from the type, now hopelessly lost.

POLYCLISTUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 161.

Head laterally semiglobose, with the vertex narrowed into a mere ridge and the subexcavate occiput perpendicularly declived immediately behind the eyes and ocelli; frons densely and very finely punctate, with the short and superficial scrobes distinct; eyes not internally emarginate; cheeks elongate with no sulci; face very strongly protuberant, densely and very finely punctate. Antennae somewhat short, stout and apically attenuate, ♂ flagellar joints elongate. Thorax with pronotum glabrous; metathorax with areola nearly always confluent with basal area, the costulae strong and all transverse lateral carinae wanting; petiolar area not discreted, supracoxal obsolete; spiracles not small. Scutellum deplanate and not margined, its basal fovea simple and linear. Abdomen stout and not narrow, subfusiform; first segment very strongly constricted basally with the carinae stout; the second to beyond centre of the fifth laterally margined; the transverse second and the following evenly and densely punctate. Legs short and very stout; intermediate calcaria of equal length; all femora clear red. Areolet wanting, stigma somewhat broad; lower basal nervure postfurcal, discoidal cell apically a little acute below; nervellus antefurcal and geniculate at its lower fourth.

This is the genus very generally known with us as *Metacoelus* (now restricted to a single American species), since Holmgren in 1873 mistook *Polyclistus* for it; this was corrected in 1887 by Thomson, who excludes *M. ventralis*, Holmgr., and recognises only the three following species. Its peculiarly prominent face, very abruptly declived occiput and basally constricted first segment render this genus distinct.

Table of Species.

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|------|----|--|-----------------------------|
| (2). | 1. | Radial nervure apically deflexed;
length 7 mm. | 1. FEMORALIS, <i>Fourc.</i> |
| (1). | 2. | Radius apically reflexed; length at
most 6 mm. | |
| (4). | 3. | Basal segment transverse; apophyses
rectangular | 2. MANSUETOR, <i>Grav.</i> |
| (3). | 4. | Basal segment elongate; apophyses
wanting | 3. FLAVICEPS, <i>Ratz.</i> |

1. femoralis, Fourc.

Ichneumon femoralis, Fourc. E. P. ii. 396; Grav. Mem. Ac. Tor. 1820, p. 383, ♀. *Exochus femoralis*, Gr. I. E. ii. 346; Steph. Illus. M. vii. 266; Fonsc. Ann. Soc. Fr. 1849, p. 236; Holmgr. Sv. Ak. Handl. 1855, p. 308; Voll. Pinac. pl. viii. fig. 3. *Metacoelus femoralis*, Holmgr. Ofv. 1873, p. 61, ♂ ♀. *Polyclistus femoralis*, Thoms. Deut. Ent. Zeit. 1887, p. 218, ♂ ♀.

A black and shining species with the mouth testaceous, and the face ferrugineous above; frons distinctly impressed above the scrobes. Antennae ferrugineous beneath; basal flagellar joint longer than broad. Legs red with the hind coxae rarely infusate and the calcaria longer than in the following species. Wings hyaline or but slightly clouded with the

stigma deep black, and the radix and tegulae flavidous or fulvescent. Length, $6\frac{1}{2}$ —7 mm.

This is the largest species of the genus and is at once known by the apex of the radial nervure being slightly curved outward, in such a manner as to render the radial cell apically strongly acute; the basal segment is longer than in *P. mansuetor*, and the areola is parallel-sided to the base with no trace of basal area; the apophyses, however, are broad as in that species, and not rounded to the apex as in *P. flaviceps*.

It appears distributed throughout all Europe, though doubtless the older authors mixed the following species with it and Thomson considers the male very rare; this sex was described by Fonscolombe as having the antennae setaceous, nearly as long as the body and dark ferrugineous beneath, the tegulae more ferrugineous than flavous, and a corpuscule on the pygidium. Dalla Torre gives no reference for his statement that Vollenhoven has bred this species from *Anobium pertinax*.

Exochus femoralis is recorded as British by Stephens, who had three specimens (one from Marsham's collection) and says it is rather scarce but found about London in June; it has consequently figured in all our Catalogues, though there are no subsequent records. I possess a female from Capron's Surrey collection and two which I captured at Monks Soham, Suffolk, on house windows in September, 1906, and beneath a lime leaf in the garden in June, 1908. Marshall took one at Nunton and Desvignes possessed another.

2. *mansuetor*, Grav.

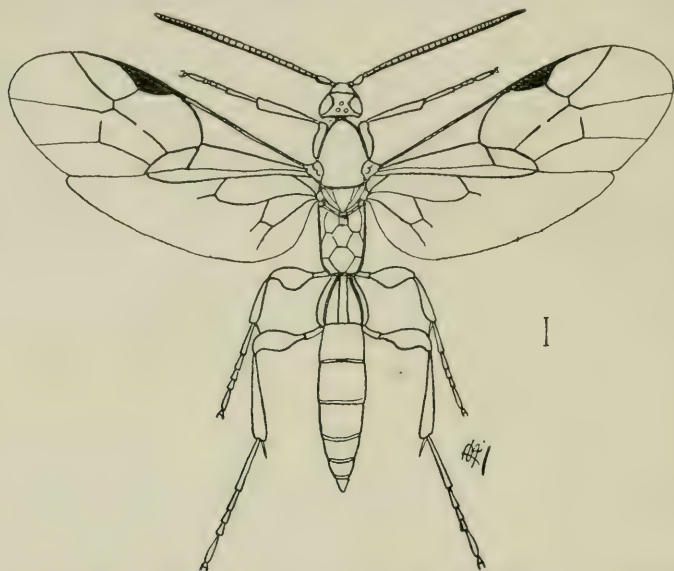
Ichneumon mansuetor, Gr. Ubers. Zool. Syst. 1807, p. 254. *Anomalon curvator*, Trentep. Isis, 1829, p. 956. *Exochus mansuetor*, Gr. I. E. ii. 339; Steph. Illus. M. vii. 265; Ratz. Ichn. d. Forst. i. 124; ii. 120; Fonsc. Ann. Soc. Fr. 1849, p. 234; Voll. Pinac. viii. fig. 4, ♀; Holmgr. Sv. Ak. Handl. 1855, p. 309; Ofv. 1873, p. 61, ♂ ♀. *E. femoralis*, Holmgr. Sv. Ak. Handl. 1854, p. 80, ♂ ♀. *Polyclistus mansuetor*, Thoms. Deut. Ent. Zeit. 1887, p. 218, ♀.

A black and shining species with the mouth testaceous, and frons very little impressed above the scrobes; antennae beneath, and a facial mark, ferrugineous; stigma deep black, with radix and tegulae flavescent; legs red, with the hind coxae often basally infusate; ♂ face not flavidous. Length, 3 — $4\frac{3}{4}$ mm.*

At once known from both the other species by the distinctly upcurved radial nervure, the consequently less acute radial cell, and the very distinctly constricted areola which is not infrequently discreted from the basal area, the basal segment is also much shorter and stouter, the body more convex and the ♀ postannellus transverse.

* When first I recognised this species in 1900, I thus described the female: Head black; vertex slightly convex, finely punctured and distinctly pubescent, with anterior ocellus placed in a slight depression; frons much produced anteriorly, antennae inserted above its apex, before which it is slightly depressed in the centre; face piceous, becoming lighter above, evenly rounded convexly, shining, with fine scattered punctures and hairs: demarcation of clypeus traceable, succeeded by a regular row of large punctures, disc almost smooth, apex immarginate, almost truncate and emarginate in the centre; mandibles fulvous, black at base and appear to be pilose, dull, and unidentate; maxillary palpi flavous, four-jointed, and fuscous at base and apex; labial palpi flavous. Antennae thick, ferrugineous below and lighter at base, somewhat piceous above, scape about as long as broad, second joint gibbose, remainder of equal breadth, broader than long, submoniliform. Thorax black; mesothorax finely punctured and shining, bordered throughout; mesopleurae and mesosternum exceedingly finely and scatteredly punctate, smooth and very nitidulous, the latter's dividing line rather broad, smooth, a little explanate and possibly aciculate at base before which is an abrupt and quite short central transverse ridge in front of the middle of the intermediate coxae;

Like Gravenhorst and Thomson, I only know what I believe to be the female of this abundant species, though the above characters are constant throughout my fifty specimens; the former found it both upon house-windows and in fields from June to August; and it occurs nearly all over the Continent. With us it is very abundant and has been found about London, at Hertford, Darenth, in the New Forest, Norfolk and Salop (Stephens); Lasingham in Yorks (Roebuck); St. Albans, Darenth and Yorkshire (Marshall coll.); Bignell once bred it in Devonshire on 9th



July from *Pyrallis farinalis*; it has also been reared from *Hyponomeuta padella* according to Gaulle, but Giraud's record from the dipterous *Stratiomys viridula* (Ann. Soc. France. 1877, p. 408) is doubtless an error, especially since Fitch bred it from *Tortrix* pupae on both willow and sallow (Entom. 1883, p. 67 et 1884, p. 68). Bradley has taken it at Sutton near Birmingham, Wilson Saunders at Reigate and Greenings, Charbonnier at Bristol and Shepton Mallet in Somerset, Capron in Surrey, Piffard in Herts., Sladen in Kent, Tuck at Bury and Benacre in Suffolk, where I have met with it only at Southwold (a single female at indoor light on 7th September, 1907) and in my own house at Monks Soham. Here, however, it is extremely common on the windows from 24th July to the end of August, every year; I once found it as late as

metathorax shining, obsoletely punctured; all the areae clean-cut and well defined; petiolar ridge producing thorax laterally but not produced beyond it; areola elongate, hexagonal-triangular; spiracles large, circular and broadly margined. Scutellum flat, rather large, black; shining, with scattered punctures and exceedingly short hairs, and a series of lateral punctures. Abdomen black, very smooth and shining, and, especially laterally towards the apex, finely punctate and pubescent; first segment suddenly elevated just before the base, bicarinate and laterally margined; second segment margined and finely but distinctly punctured laterally; apex somewhat ferrugineous, with grey-red hairs: last ventral segment very remote from last dorsal; terebra rufous, deflexed and exserted, projecting from level with base of fourth dorsal segment and not quite reaching apex of abdomen; valvulae shorter than terebra, rufous and finely pilose; abdomen picceous below with ill-defined lighter central fold. Legs incrassate, entirely rufous but posterior coxae very slightly darker, the hind ones punctured with shallow, longitudinal median depression; tibiae externally and tarsi beneath setose. Wings slightly clouded, areolet wanting; stigma and nervures nigrescent, radix flavous. Length, $4\frac{1}{2}$ mm.

20th September, and on 21st October, 1906, captured one sitting upon and sucking the juice of an ivy blossom in the garden. I have suspected it of preying upon *Anobium domesticum* or house *Tineæ*, but the present species never occurred to me in Ipswich, where these insects are common enough; and I now consider it more probable that it flies across from *P. farinalis* in the adjacent farm, or my own stables.

3. *flaviceps*, Ratz.

Exochus flaviceps, Ratz. Ichn. d. Forst. iii. 132; Holmgr. Sv. Ak. Handl. 1855, p. 309; Voll. Pinac. pl. viii, fig. 5, ♂. *Metacoelus flaviceps*, Holmgr. Ofv. 1873, p. 62, ♂. *Polychlistus facialis*, Thoms. Deut. Ent. Zeit. 1887, p. 218, ♂ ♀.

A shining black species with the mouth, scape beneath, radix and tegulae flavous; the legs flavescent-fulvous and in ♂ the face, cheeks, pleural marks, anterior coxae and trochanters concolorous. Length, 3—6 mm.

Very like the last species but both sexes are at once known by the testaceous stigma, the gently rounded metathorax which is not subquadrately prominent at the apophyses, and the apically straight radius which is neither deflexed nor reflexed, rendering the radial cell but moderately acute apically; the ♀ differs from the last species in its elongate postannellus, the ♂ in its flavous face and both sexes in their parallel-sided areola which extends to the extreme base with no indication of basal area. My females are $2\frac{3}{4}$ — $3\frac{1}{2}$ mm. and the males 5 mm. Thomson states the hind tibiae to be basally black, which feature I am unable to follow.

This species has not hitherto been noticed in Britain, and the female is much mixed with the preceding; I possess, however, both sexes of which he had recognised the male, in Dr. Capron's Surrey collection; and on 16th April, 1898, I took several yellow *Tortricid* pupae in their own cocoons beneath moss on oak trunks in a fir wood at Foxhall in Suffolk, from which emerged no lepidopteron but a single specimen of the dip-teron, *Lonchaea tarsata*, Fln., and a single male of the present species. The latter had entirely removed the capital extremity of the chrysalis in a very irregular manner. The female occurs with the last species at Monks Soham in August. Ratzeburg described the male from material bred by Nördlinger in Germany from cherry wood infested by the Tipulid, *Ctenophora atrala* and a species of *Sphex*; subsequently Holmgren took the same sex rarely in central and southern Sweden, whence Thomson described the female.*

* Mr. Luff sent me from Guernsey in April, 1900, a female, which I at that time considered to belong to the present species; this I now know to be impossible and give the following diagnosis, which I then drew up, in order to elucidate the matter. It is certainly referable to *Metacoelus*, as understood by Holmgren in 1873, with the abdomen black and its upper margins only occasionally rufescent; the legs are for the most part flavous and not red, all of which points coincide with *P. flaviceps*, Ratz.

It differs from my detailed description of *P. mansuetor*, as follows:—Forehead not depressed centrally before its apex; whole of cheeks, face, and mouth parts flavous, thickly and rather rugosely punctured throughout, apices of mandibles ferrugineous; clypeus without larger punctures; flagellum not much thickened, ferrugineous throughout below, apices of joints narrowly black; scape flavous and conical, following joints cylindrical, slightly nodose at their apices; propleurae black, but the prosternum narrowly flavous immediately before the front coxae; areola elongate, hexagonal-rectangular; abdomen distinctly punctured throughout and apically pubescent; terebral valvulae black, not shorter than terebra, slightly deflexed and exerted, projecting from level with base of seventh dorsal segment and extending slightly beyond apex of abdomen; a well-defined central fold on three basal segments. Legs incrassate, entirely fulvescent, anterior or front ones lighter with coxae and trochanters stramineous; hind coxae rufous, punctured, with base slightly fuscous; tibiae externally and tarsi beneath nude. Wings with tegulae flavous. Length, 5½ mm.

PERIOPE, *Haliday*.

Hal. Ann. Nat. Hist. 1839, p. 114; *Monoplectron*, Holmgr. Sv. Ak. Handl. 1855, p. 81; *Oligoplectron*, Först. Verh. pr. Rheinl. 1868, p. 161.

Head transverse with the face subprotuberant; clypeus basally subarcuately impressed, but not discreted; mandibles broad with stout teeth; eyes oblong and somewhat emarginate next the scrobes; inter-antennal process not cristulate behind. Antennae subclavate, apically incrassate, strongly attenuate basally, short and not as long as the body; scape not cylindrical. Thorax stout, gibbous and short; mesosternal epinemia interrupted above; metathorax with areae, of which the petiolar extends to its centre; costulae wanting; spiracles circular. Scutellum immarginate and subconvex. Abdomen subpetiolate, narrow, elongate-fusiform and in ♀ apically a little compressed; spiracles of the basally constricted first segment a little beyond its centre; sixth ventral segment extending nearly to anus; terebra concealed. Legs short but not very stout; front and hind tibiae unicalcarate; claws pectinate. Areolet small, petiolate and obliquely subcircular; lower basal nervure postfurcal; nervellus antefurcal, suboblique and intercepted a little below the centre.

At once known from all other Exochid genera by the unicalcarate hind tibiae and remarkable subclavate antennae. The genus was named *Periope* in the first edition of Curtis' Guide, Appendix, No. 538, though not there described. There is but one palaeartic species of this genus, first described from Britain; but in 1897 Davis placed the Canadian *Tryphon aethiops*, Cress., in it.

1. *auscultator*, *Hal.*

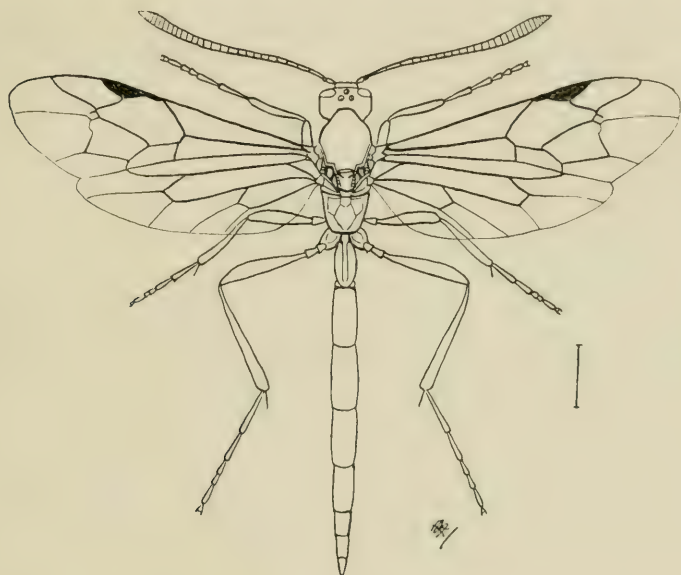
Ichneumon impugnator, Schr. En. Insect. Austr. 368, ♀; F. B. ii. 300, ♂ ♀; etc.; cf. Gr. I. E. iii. 105 (?). *Periope auscultator*, Hal. Ann. Nat. Hist. 1839, p. 114, ♀; Thoms. Deut. Ent. Zeit. 1887, p. 198, ♂ ♀. *Monoplectron zygacnator*, Holmgr. Sv. Ak. Handl. 1854, p. 81; *lib. cit.* 1855, p. 306, pl. ix, fig. 19; cf. *l. c.* p. 389 et Westw. Introd. ii. Synop. 57.

A black and very strongly nitidulous species with the abdomen centrally, femora apically, tibiae and tarsi, red. Head black, shining and not constricted posteriorly; frons apically impressed; face punctate and subprominent; clypeus not discreted; mandibles a little constricted apically, with the teeth subequal in length; palpi infusate. Antennae nigrescent and basally attenuate, of ♀ becoming ferrugineous beneath from the centre; two basal flagellar joints elongate and nitidulous, the following pilose and quadrate, becoming transverse from the tenth, the apical joint conical and strongly obtuse; flagellum of ♂ 23- and of ♀ 19-jointed. Thorax stout and black; metathorax with the areola small and subtransverse, the two lateral areae triangular, and the supracoxal large and glabrous; spiracles circular. Scutellum glabrous, black, immarginate and subconvex, with its basal fovea not narrow. Abdomen strongly nitidulous, subcylindrical and deplanate with the ♀ anus subcompressed; segments two and three red with their base infusate; basal segment bicarinate with the postpetiole subquadrate and spiracles slightly behind the centre; the basally punctate second and the third more or less broadly red; and

the following black, pubescent. Legs black and not slender; tibiae and tarsi fulvous. Wings very slightly infumate, with the stigma and nervures testaceous; areolet irregularly triangular and petiolate, with the lower half of the external nervure pellucid; radial nervure apically curved; nervellus intercepted nearly in its centre. Length, 6—8 mm.

Schrank's Austrian species was taken "in agris frumentariis"; I consider it extremely probably correctly here synonymised, though the relationship has not been noted since suggested by Haliday, and the author's description is too short to admit of certainty in this respect.

Haliday took his female in Ireland at Eyrecourt in Galway, in a grove of larches during September, before 1839; his MS. in the Dublin Museum



indicates the species as common in Ireland. The first reliable Continental notice is in 1854 from the central and southern districts of Sweden, where Holmgren found it not uncommonly in woods and fields, "in Lepidopterorum larvis ova deponentes." It is said by Thomson to extend throughout all Europe and by Gaulle to have been bred from species of *Zygaena* in France; Förster, too, seems to have known it from Germany. With us, however, it is quite certainly scarce and occurs only in the north: I have seen four specimens in the National Collection found by Rev. T. A. Marshall, many years ago, at Glencoe; Mr. C. H. Mortimer kindly gave me the ♀ taken by him at Soay in the Island of Skye during September, 1909 (E. M. M. 1910, p. 39); and Mr. Routledge has also presented me with a ♂ captured by him at Tarn Lodge, ten miles from Carlisle, on July 16th, 1902.

EXOCHUS. *Gravenhorst.*

Gr. I. E. ii (1829). 328.

Head not declived abruptly immediately behind the eyes, more often with vertical dots white; face strongly protuberant and punctate; frons centrally triangularly elevated; eyes subemarginate next the scrobes. Antennae shorter than body, not incrassate apically with the scape not cylindrical. Thorax nitidulous and subdeplanate; notauli wanting or very short; discal metanotal areae distinct with areola strong, though usually basally and sometimes apically incomplete; costulae wanting or entire; spiracles oval or subcircular. Scutellum deplanate and not small. Abdomen black and nitidulous, not scabriculously punctate and at most centrally or laterally pale; basal segment not rugose, distinctly bicarinate discally with spiracles at or near the subconstricted base; second not carinate nor dull; terebra concealed. Legs short; femora strongly incrassate; hind tibiae bicalcarate, the intermediate of equal or unequal length; claws stout. Wings more usually with the areolet wanting, but sometimes entire and irregularly triangular; basal nervure strongly curved above, rarely continuous through the median.

I am quite unable to find any good generic characters in Förster's names *Triclistus*, which has been frequently employed by systematists, and *Amesolytus*, for which Szépligeti has recently discovered new Hungarian species. Holmgren in 1873 first made use of Förster's generic names, though not his characters; he called *Polyclistus*, *Metacoelus* and differentiated *Triclistus*, not by its lack of costulae, but by its possession of alar areolet and interantennal cristulae; his characters were good, and I should have been inclined to give them place above Förster's, had he not employed the latter's names. Thomson in 1887 corrected *Metacoelus*, Holmgr. to *Polyclistus*, Först., and described a genus *Triclistus* including species of *Exochus*, *Triclistus*, and *Amesolytus*, Först. These useless genera may be thus tabulated:—

- | | | |
|-------|--|---------------------|
| (2). | 1. Abdomen petiolate; petiolar spiracles beyond centre | <i>Alcocerus.</i> |
| (1). | 2. Abdomen sessile; spiracles distinctly before centre. | |
| (8). | 3. Basal lateral areae discreted from dentiparal (costulae entire). | |
| (5). | 4. Vertex strongly carinate posteriorly; with areolet | <i>Metacoelus.</i> |
| (4). | 5. Vertex not carinate posteriorly. | |
| (7). | 6. Head declived immediately behind eyes; face longer | <i>Polyclistus.</i> |
| (6). | 7. Head broader behind eyes; face less protuberant | <i>Exochus.</i> |
| (3). | 8. Basal lateral areae confluent with dentiparal (costulae wanting). | |
| (10). | 9. Areolet present; metanotal carinae incomplete | <i>Triclistus.</i> |
| (9). | 10. Areolet wanting; metanotal carinae complete | <i>Amesolytus.</i> |

I have carefully traced Thomson's distinctions between his *Triclistus* and *Exochus*, with the result that I cannot consider them distinct, since the following are the only characters he enumerates:—

TRICLISTUS, Thoms.

Ocelli forming a triangle.
Frons very shortly cristulate.
Scape not arcuate.
Intermediate calcaria of equal length.
[Genal sulcus wanting;
Head always black;
Areolet often present;

EXOCHUS, Thoms.

Ocelli forming nearly a curved line.
Frons with no cristula.
Scape arcuate.
Intermediate calcaria strongly unequal.
Genal sulcus often impressed;
Vertex often pale-marked;
Aroelet always wanting.]

The last three characters are inconstant and cannot add to the stability of the former genus. As to the Försteran names, the presence or absence of alar areolet is a capital feature on paper, but in the present group one often finds a well marked areolet in one wing and but the faintest indication thereof in the other of the same specimen; and I am of opinion that much future synonymy has been erected upon this variable feature. Bridgman regarded it as "a question if such trivial distinctions as the absence of areae on the metathorax have any right to be raised into species" (Entom. 1880, p. 258): how much less then should we found genera upon the lack of a small transverse carina, be it ever so constant; and, in fact, it is, in this group at least, a capital character for dividing up the species into groups, though not equally apparent in both sexes. *Polyclistus*, *Periope*, *Chorinacus*, etc., have well marked characters and distinct facies, in spite of what Vollenhoven says of them, but I think it invidious to them to raise the obscure features of *Triclistus* and *Amesolytus* to equal rank. Moreover, species occur with both areolet and costulae, for which even Förster was not prepared with a generic name, for the head in these is often normal and unlike that of *Metacoelus*. In the following account of our species of *Exochus* I have somewhat closely followed Prof. Thomson, who, though apparently obscure on many points of primal distinction will be found to have given very beautiful differential characters if his remarks be worked in conjunction with the more detailed descriptions of authors. Seventeen species were enumerated as British by Marshall in 1872, and I added eleven in 1901; to these twenty-eight, four new to Britain and one to Science are here enumerated with the result that, after synonymizing several, the total stands at thirty out of the sixty-five known palaearctic kinds.*

* Besides those enumerated, I possess two males and a female of a species I am unable to tabulate, evidently belonging to Thomson's unsatisfactory intermediate section with the areolet wanting and the hind calcaria shorter than the hind tibial breadth though by no means minute (*cf.* 34 et 43 in the Table). They are black with the femora and tibiae entirely red, the facial fascia and vertical dots pale in ♂ but immaculate black in ♀. The species appears most closely allied to *E. tardigradus*, Gr. (*nec* Holmgr.), from which the tibial colour precludes it. In every respect it is intermediate between *E. prosopius* and *E. parvispina*. It is probably a common kind, since I have it from Nantua in France (ex coll. Marshall), Shere in Surrey (ex coll. Capron) and took the type at Lyndhurst in the New Forest on 17th August, 1901. No published description, however, quite tallies with it, so I tentatively propose to term it *Exochus intermedius*, Morl.

Table of Species.

- (24). 1. External areae confluent with dentiparal, *i.e.*, costulae wanting; intermediate calcaria of equal length [TRICLISTUS, Thoms.].
- (23). 2. Areolet more or less distinct [TRICLISTUS, Först.].
- (22). 3. Face and thorax immaculate black; areolet subtriangular.
- (21). 4. Areola parallel-sided; metanotum double length of petiolar area.
- (12). 5. Basal segment distinctly longer than apically broad; stigma emitting radius from centre.
- (9). 6. Areolet sessile; face dull and very closely punctate.
- (8). 7. Basal segment slightly longer than broad; coxae black 1. PODAGRICUS, Grav.
- (7). 8. Basal segment much longer than broad; legs entirely pale 2. PALLIDIPE, Holmgr.
- (6). 9. Areolet strongly petiolate; face nitidulous and sparsely punctate.
- (11). 10. Length less than 5 mm. 3. NITIDIFRONS, Thoms.
- (10). 11. Length at least 5 mm. 4. CURVATOR, Fab.
- (5). 12. Basal segment not longer than broad; stigma emitting radius beyond centre.
- (20). 13. Hind femora rarely black; metathoracic spiracles larger.
- (15). 14. Flagellum basally red; hind tibiae white, apically black 5. GLOBULIPES, Desv.
- (14). 15. Flagellum black above; hind tibiae rufescent throughout.
- (17). 16. Areolet sessile, emitting recurrent nervure from centre 6. LONGICALCAR, Thoms.
- (16). 17. Areolet petiolate, emitting recurrent nervure from beyond its centre.
- (19). 18. Calcaria elongate; areolet triangular and shortly petiolate 7. CONGENER, Holmgr.
- (18). 19. Calcaria short; areolet oblique and elongately petiolate 8. SPIRACULARIS, Thoms.
- (13). 20. Hind femora black; metathoracic spiracles smaller 9. AETHIOPS, Grav.
- (4). 21. Areola apically explanate; metanotum not twice length of postica 10. LATIVENTRIS, Thoms.
- (3). 22. Face and thorax flavous-marked; areolet pentagonal 11. ANTIQUUS, Hal.
- (2). 23. Areolet entirely wanting [AMESOLYTUS, Först.] 12. NIGER, Bridg.
- (1). 24. External areae discreted from dentiparal, *i.e.*, costulae present [EXOCHUS, Först.].
- (26). 25. Frontal carinae and areolet distinct [TRICLISTUS, part., Thoms.] 13. SQUALIDUS, Holmgr.
- (25). 26. Frontal carinae and areolet wanting [EXOCHUS, Holmgr.]; intermediate calcaria strongly unequal [EXOCHUS, Thoms.].

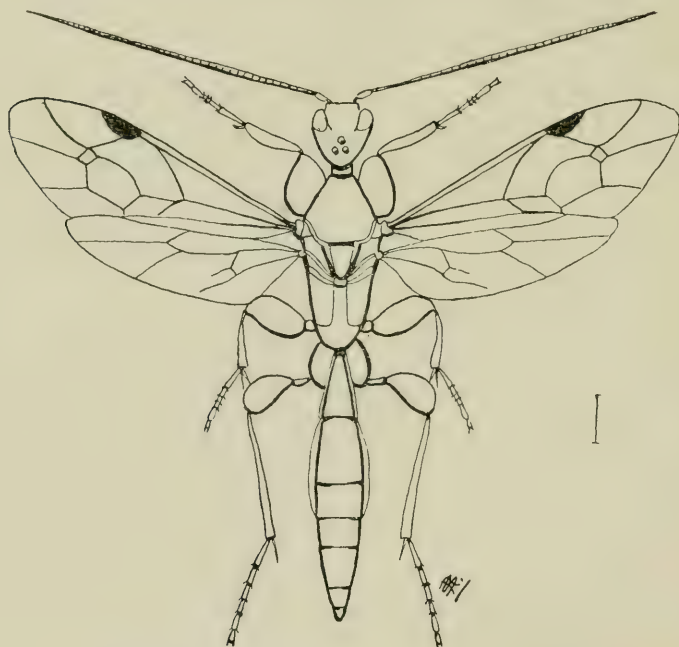
- (58). 27. Hind femora mainly red; vertical orbits with pale dots.
- (33). 28. Basal nervure exactly continuous through the median.
- (32). 29. Carinae of basal segment extending to centre; thorax immaculate.
- (31). 30. Abdomen immaculate black; femora entirely red 14. GRAVIPES, *Grav.*
- (30). 31. Abdomen centrally red; femora basally broadly black 15. GRAVIS, *Grav.*
- (29). 32. Carinae of basal segment extending to apex; thorax pale-marked 16. BRITANNICUS, *Morl.*
- (28). 33. Basal nervure distinctly postfurcal below median.
- (43). 34. External hind calcar as long as apical breadth of its tibia.
- (38). 35. Frontal orbits immaculate black; ♀ coxae concolorous.
- (37). 36. Antennae attenuate; ♂ face entirely, and scutellum apically, pale 17. PROSOPIUS, *Grav.*
- (36). 37. Antennae filiform; ♂ face and scutellum not pale 18. NIGRIPALPIS, *Thoms.*
- (35). 38. Frontal orbits partly pale, and coxae usually concolorous.
- (42). 39. External orbits distinctly pale; thorax never red-marked.
- (41). 40. Areola entire; stigma and sides of ♂ abdomen pale 19. FLAVOMARGINATUS, *Hlg.*
- (40). 41. Areola apically wanting; stigma and abdomen black 20. PICTUS, *Holmgr.*
- (39). 42. External orbits immaculate; thorax often mainly red 21. ERYTHRONOTUS, *Grav.*
- (34). 43. External hind calcar minute, much shorter than breadth of tibia. [Cf. *intermedius*, *Morl.*]
- (45). 44. Frontal orbits and whole face stramineous 22. DECORATUS, *Holmgr.*
- (44). 45. Frontal orbits and at least part of ♀ face black.
- (53). 46. Hind tibiae broadly white-banded, with base black.
- (50). 47. Hind tarsi white, determinately black-banded.
- (49). 48. Scutellum black; hind tibiae nigrescent 23. ALPINUS *Zett.*
- (48). 49. Scutellum apically pale; hind tibiae rufescent 24. NOTATUS, *Holmgr.*
- (47). 50. Hind tarsi not black-banded.
- (52). 51. Areola parallel-sided; hind tibiae tricoloured 25. LENTIPES, *Grav.*
- (51). 52. Areola apically explanate; hind tibiae bicoloured 26. TIBIALIS, *Holmgr.*
- (46). 53. Hind tibiae red, at most with extreme base black or white.
- (55). 54. Basal segment bicarinate to centre; hind tibiae basally white 27. FLETCHERI, *Bridg.*
- (54). 55. Basal segment not bicarinate to centre; tibiae not basally paler.

- (57). 56. Slender; hind tibiae unicolorous red throughout 28. PARVISPINA, *Thoms.*
 (56). 57. Stouter; hind tibiae nigrescent towards their base 29. SEPTENTRIONALIS, *Hlg.*
 (27). 58. Hind femora black; vertical orbits immaculate black 30. ALBICINCTUS, *Holmgr.*

1. *podagricus*, *Grav.*

Exochus podagricus, Gr. I. E. ii. 336; Steph. Illus. M. vii. 265, ♀; Brisch. Schr. Ges. Kön. 1871, 101, ♂ ♀; Holmgr. Sv. Ak. Handl. 1855, p. 320, excl. form typ.; Voll. Pinac. pl. xxxviii, fig. 7. *E. laevigatus*, Ratz. Ichn. d. Forst. ii. 120, ♀. *Triclistus podagricus*, Holmgr. Ofv. 1873, p. 58, pl. ii, fig. 5, 6, ♀; Thoms. Deut. Ent. Zeit. 1887, p. 204, ♂ ♀.

Head entirely black; vertex and occiput finely punctate and pilose, former very narrow with anterior ocellus on lower plane than posterior, latter gradually and distinctly though not abruptly narrowed behind the



eyes, and posteriorly terminating in a slightly raised and centrally obsolete border; frons finely punctate and pilose with a distinct narrow glabrous central impression anteriorly produced between scrobes into a corneous prominence about half length of scape, and pubescent; its under side renders the face prominent; the latter is dull, slightly convex, densely and very finely punctate with sparse piceous hairs; clypeus more shining and less densely punctate, not discreted from face, apically deflexed and broadly truncate; mandibles piceous, very large (overlapping about half

of opposite side), bifid with the upper very slightly the longer tooth, somewhat longitudinally punctate and a little uneven, about as broad as clypeus; maxillary palpi cylindrical and flavous; labial palpi nearly as long as maxillary, also flavous and cylindrical. Antennae short with the scape moniliform; basal flagellar joint cylindrical and elongate, second a little longer, and third as long as first; remainder distinctly transverse, piceous and becoming ferrugineous basally. Thorax black; mesothorax with evenly scattered punctures and piceous hairs, shining, bordered throughout; mesopleurae very finely punctate, glabrous and produced posteriorly into obtuse teeth; mesosternum a little more closely punctured and very slightly convex with the interpectoral sulcus smooth, narrow, trans-striate and basally bordered; metathorax glabrous, with ferrugineous hairs on either side of the complete and elongate areola; costulae wanting; petiolar area short with its basal carina entire but not laterally produced; spiracles ovate and not small. Scutellum black, punctate, nitidulous, somewhat large, flat, very finely bordered, with recumbent pilosity towards its apex. Abdomen black and strongly glittering, apex finely pilose, puncturation obsolete; first segment gradually narrowed from apex to base, discally bicarinate basally, sulcate between carinae and sometimes foveate before apex; two basal and base of third segment finely margined laterally and very finely punctate laterally, with fourth segment the broadest; three basal ventral segments flavous-plicate. Legs incrassate, rufescent, punctate, pubescent and somewhat dull; the deplanate coxae, short trochanters and anterior femora more or less piceous; hind femora usually black with their apices piceous. Wings hyaline; areolet somewhat large, obliquely transverse and but slightly petiolate, emitting recurrent nervure far beyond its centre; radius emitted from centre of stigma, which is black with paler base; nervures piceous, radix and tegulae fulvous. Length, $4\frac{1}{2}$ —6 mm.

Easily recognised by its mainly black coxae and often femora, somewhat curved basal segment which is only about a quarter as long again as apically broad, with the second a little longer than broad, the third laterally finely but distinctly punctulate and the remainder discally glabrous with their sides sparsely pubescent, and by the somewhat large areolet which is but slightly petiolate and externally a little curved.

Common throughout Europe, living in caterpillars of *Tinea populella*, *Tortrix* and *Lithocolletis*, according to Ratzeburg and Vollenhoven. Not uncommon about London and in Shropshire (Stephens); taken at Lynn in Norfolk by Atmore (Bridgman); and bred in Devonshire on 18th September from *Symaethis oxyacanthella* (Bignell). I have it from Bugbrooke in Northants, Cornworthy in Devon, Botusfleming in Cornwall (Marshall), Shere in Surrey (Capron), Felden in Herts (Piffard) and York, where Bankes bred two females in 1905 from larvae of *Eupithecia trisignata*, Hs. It has occurred to me in Wicken marshes on sallow in Cambs. in June, and not uncommonly both in the Bentley Woods near Ipswich on hazel bushes and at Wilverley, Denny and Brockenhurst in the New Forest, from the end of May to 19th June; Gravenhorst found it in August.

2. *pallidipes*, *Holmgr.*

Triclistus pallipes, Holmgr. Ofv. 1873, p. 59, ♀; Thoms. Deut. Ent. Zeit. 1887, p. 204, ♂ ♀.

An elongate black species with the legs entirely flavescent, the metathoracic spiracles small and areolet subsessile. Length, 4—5 mm.

Very like the last species but longer and narrower with the abdomen nearly entirely glabrous, the basal segment double the length of its apical breadth, the second suboblong-quadrate, the legs entirely pale, the areolet more sessile and its outer nervure nearly straight. Probably little more than a form of the preceding.

Hardly rarer than *E. podagricus*, but much mixed with it. I have seen it from Achill Sound, Co. Mayo (Johnson), possess it from Botusfleming in Cornwall (Marshall), Shere in Surrey (Capron), and have taken it with the above in the Bentley Woods and with *E. lativentris* at Sandown in the Isle of Wight, as well as upon flowers of *Angelica sylvestris* at Tuddenham in Suffolk. It has not been recorded from Britain before; and Brischke has bred it (Schr. Nat. Ges. Danz. 1878, p. 107) from larvae of *Eupithecia trisignaria* in Prussia.

3. *nitidifrons*, *Thoms.*

Triclistus nitidifrons. Thoms. Deut. Ent. Zeit. 1887, p. 204, ♂ ♀.

A small black species with the legs entirely flavescent, the face shining and very finely punctate, and the areolet elongately petiolate. Length, $3\frac{3}{4}$ — $4\frac{1}{2}$ mm.

A small form of the two preceding, differing in its more shining and less closely punctate face, small and strongly petiolate oblique areolet, and the more exactly filiform antennae.

It was described from France and Sweden; and Bridgman recorded it from Mousehold (in August, 1877, upon Thomson's authority, cf. Trans. Ent. Soc. 1887, p. 374) and Bawsey Heaths in Norfolk. I have several in Dr. Capron's Surrey collection, and swept it in the middle of June, 1907, at Matley Bog, in the New Forest. Halbert took a female in the Isle of Achill on the coast of Co. Mayo, Ireland, in June, 1909.

4. *curvator*, *Fab.*

Ichneumon curvator, Fab. E. S. ii. 177; Gr. Nov. Act. Ac. Cur. 1818, p. 285. *Cryptus curvator*, Fab. Piez. 88. *Exochus curvator*, Gr. I. E. ii. 335; Steph. Illus. M. vii. 265, ♀; Brisch. Schr. Ges. Kön. 1871, p. 101, ♂ ♀. *E. fulvipes*, Cress. Ent. Soc. Phil. 1864, p. 285; Prov. Nat. Canad. 1880, p. 5, ♂ ♀. *Triclistus curvator*, Holmgr. Ofv. 1873, p. 58; Davis, Trans. Amer. Ent. Soc. 1897, p. 213, ♂ ♀.

A shining black species. Head black, with the palpi pale testaceous and the frons distinctly carinate before the ocelli. Antennae with flagellum rufescent beneath towards the base. Metanotal costulae wanting. Legs entirely red, or with the coxae alone partly black, or with all or only part of the hind femora also black. Wings with stigma nigrescent, radix and tegulae stramineous or the latter sometimes infuscate; radial nervure emitted from centre of stigma; areolet entire. Length, 5—6 mm.

I do not know this species, which is not mentioned by Thomson and appears very like his *Triclistus pallipes*, in which case his *T. nitifrons* might be supposed to be *T. pallipes*, Holmgr. Gravenhorst's description contains no distinctive feature except the areolet "irregulari, oblique transversa longepetiolata," which agrees admirably with *T. nitifrons*, though the size is somewhat large.

Stephens professes to have taken it near London in June, though his specimen is referable to *E. pallidipes*; and Bignell captured it at Bickleigh in Devon on the 19th of that month; but a female I found in the New Forest in May, 1895, determined as belonging to the present species by Rev. T. A. Marshall, is very certainly referable to *E. podagricus* and has the areolet subsessile. It is said to have been bred from *Nothris verbascella* by Brischke and *Tortrix Rileyana* by Grote.

5. *globulipes*, Desv.

Exochus globulipes, Desv. Cat. 45, ♂ ♀. *E. Holmgreni*, Boh. Ofv. 1863, p. 79; Voll. Pinac. pl. xxxviii, fig. 5, ♂ ♀. *Triclistus Holmgreni*, Holmgr. Ofv. 1873, p. 57, pl. ii, fig. 6, ♀; Thoms. Deut. Ent. Zeit. 1887, p. 205, ♂ ♀.

A black species, with the antennae and legs mainly flavous; hind legs black or nigrescent with the trochanters and tibiae, except apically, pale stramineous; areolet petiolate and almost narrower than broad. Length, 6—7 mm.

The colouration of the antennae and hind legs is peculiar and at once renders this species distinct; the coxae and usually the femora are black, the tibiae are whitish with their apices and calcaria abruptly deep black. Marshall regarded this species as *E. squalidus*, but it differs in its lack of costulae, etc.

It has rarely been noticed, but is doubtless common throughout northern and central Europe. No doubt can be entertained, I think, respecting the previously unnoticed synonymy of Desvignes' species, which Bridgman (Trans. Norf. Soc. 1893, p. 628) doubtfully records as bred by Atmore at Kings Lynn in Norfolk from the Tortricid, *Paedisca semifuscana*. I have a dozen bred by C. G. Barrett and a good series from Botusfleming in Cornwall, Govilon, Manchester, Grovely Wood and Cheltenham (Marshall), Felden in Herts (Piffard), Shere in Surrey (whence Boheman's species was introduced as British, Trans. Ent. Soc. 1887, p. 374, on Thomson's authority); and a large female bred by Bignell in Devon on 15th July, 1897, from the accompanying pupa of *Tortrix viridana* from which it had emerged by almost entirely removing the extreme capital apex in an irregular, jagged manner. This species has occurred to me on bracken at Wilverly Inclosure in the New Forest in the middle of June, I found several in Tuddenham Fen at the end of August, 1905, and on 25th September, 1902, secured two on the flowers of *Angelica sylvestris* at Foxhall, near Ipswich.

6. *longicalcar*, Thoms.

Triclistus longicalcar, Thoms. Deut. Ent. Zeit. 1887, p. 205, ♀.

Black with the legs flavous and the coxae basally nigrescent, the antennae and calcaria elongate, and the large areolet nearly rhomboidal, emitting the recurrent nervure from its centre. Length, 6½ mm.

Known from *E. podagricus* by its rather stouter and longer size, longer antennae and calcaria of which the internal hind ones reach beyond centre of their metatarsi, by the subinfumate wings, the structure of the sessile areolet and the obviously smaller spiracles; as well as the shorter basal segment and basal position of the radial nervure.

I am not aware that this species has been recognised since first described from Sweden, but I have a female, certainly referable to it, which was captured at Felden, near Boxmoor, in Herts. by the late Albert Piffard.

7. *congener*, *Holmgr.*

Exochus congener, Holmgr. Sv. Ak. Handl. 1855, p. 319; Brisch. Schr. Ges. Kön. 1871, p. 101; Voll. Pinac. pl. xxxviii, fig. 6, ♂ ♀. *Triclistus congener*, Holmgr. Ofv. 1873, p. 57; Davis, Trans. Amer. Ent. Soc. 1897, p. 212, ♂ ♀. *T. pubiventris*, Thoms. Deut. Ent. Zeit. 1887, p. 205, ♂ ♀.

A black species with the legs except basally flavescent, the areolet large though a little petiolate and emitting the recurrent nervure from beyond its centre. Length, $6\frac{1}{2}$ mm.

Related to the last species in the size, outline and conformation of both calcaria and spiracles, but having the second segment laterally more closely and coarsely punctate, the third and following more densely punctate and grey-pubescent, and the areolet of different shape.

It occurs both in Europe and the United States of America; and little doubt is admissible that the above species are synonymous. Thomson appears to have erected new names in this genus whenever he failed to follow Holmgren's diagnoses.

E. congener is in Marshall's Catalogue and recorded as bred from a Hungarian pupa of *Nola cicatricalis*, Tr., by Baker (Entom. 1883, p. 67); and there are three specimens under this name from Milford Haven, Cornworthy, and Darenth Wood in the former's collection. Bridgman introduces the latter as new to Britain on the strength of a specimen he had taken at Earlham near Norwich during June, 1878 (Trans. Ent. Soc. 1887, p. 374) on Thomson's authority; and I have a couple taken by Dr. Capron at Shere in Surrey. Brischke tells us (Schr. Nat. Ges. Danz. 1878, p. 107) that he has raised it from *Nothris verbascella* and a species of *Tortrix* in Prussia.

8. *spiracularis*, *Thoms.*

Triclistus spiracularis, Thoms. Deut. Ent. Zeit. 1887, p. 205, ♀.

Black and shining with the legs pale, the metathoracic spiracles large, calcaria short and wings hyaline with the areolet oblique and elongately petiolate; ♂ with the flagellum basally pale throughout. Length, 5 mm.

Smaller than *E. congener*, with shorter calcaria and the areolet more petiolate and oblique.

I possess four specimens of this Swedish species, not hitherto recorded as British, whose hitherto undescribed ♂ differs only in its narrower body and longer, basally pale antennae, from Dr. Capron's Surrey Collection, and a couple were bred with *Chorinacus tricarinatus* and *Microgaster tibialis* at the end of May, 1898, from Colchester larvae of *Depressaria scopariella*, Hein., by Banks.

9. *aethiops*, Grav.

Exochus aethiops, Gr. I. E. i. Suppl. 693; Steph. Illus. M. vii. 265; Brisch. Schr. Ges. König. 1871, p. 101. *Triclistus aethiops*, Thoms. Deut. Ent. Zeit. 1887, p. 206, ♀.

A black species with the tegulae concolorous and the tibiae infusate with the front ones pale. Metathoracic spiracles small. Basal segment not or hardly longer than apically broad, with distinct discal carinae. All the coxae, trochanters and femora black; front tibiae red, the intermediate entirely and hind ones externally rufo-ferrugineous and the latter internally infusate; tarsi rufescent, with the hind ones darker. Wings with radius emitted beyond centre of stigma; areolet sub sessile, nearly regularly triangular and larger than usual. Length, 5 mm. ♀ only.

Thomson, who places this species among those with the basal segment not or hardly longer than broad, in spite of Gravenhorst's "segmento primo latitudine duplo fere longiore," regarded it as distinct from all other *Triclisti* in the broader and posteriorly more produced vertex, griseous-hyaline wings, radius emitted from nearly the apical third of the narrow stigma with its apex hardly at all curved, the somewhat elongate petiole, slender hind tarsi, very short external calcaria and large areolet.

I know nothing of this species, which Gravenhorst described from Netley in Shropshire, Brischke found in Prussia and Thomson in Sweden. Stephens, as usual, professes to have found it near London in June; his specimen, the only one in the National Collection, is correctly named.

10. *lativentris*, Thoms.

Triclistus lativentris, Thoms. Deut. Ent. Zeit. 1887, p. 203, ♂ ♀.

A black species with the legs, except coxae and trochanters and sometimes femora, red; metanotal costulae wanting and spiracles large; wings hyaline with the areolet obliquely transverse, petiolate and sometimes externally incomplete. Petiolar area exactly half length of metanotum; areola apically dilated; hind calcaria not elongate. Length, 5 mm.

This species is of the size and outline of *E. podagricus* but the petiolar area is longer, the areola apically explanate, the apical discal segments are centrally finely punctate and pubescent, the basal shorter with longer carinae, the second subtransverse and the anterior femora are often black-marked beneath.

A single specimen of this Swedish species was bred in May, 1884, by Fletcher from *Emmelesia alchemillata*, probably at Worthing (Trans. Ent. Soc. 1887, p. 374) and named by Thomson. I have swept another from low herbage on the Red Cliff at Sandown, Isle of Wight, on 29th June, 1907; this hardly appears typical since the hind femora are deep black and the areola is peculiarly obsolete, though distinctly dilated apically.

11. *antiquus*, Hal.

Exochus antiquus, Hal. Ann. Nat. Hist. 1839, p. 113, ♂.

Head and thorax black with the facial orbits and lines before the radices flavous. Abdomen immaculate. Legs flavous with the hind ones basally fulvous and their coxae black. Wings with the areolet pentagonal. Length, 6½ mm. ♂ only.

No other known Exochid has pale-marked face and thorax combined with alar areolet, so if correctly placed in this group by its author, whose acumen in this respect is so well-known, it cannot fail to be abundantly distinct.

Halliday records the type, which is doubtless among his other unlabelled rarities in the Dublin Museum, from Holywood; the species has not since been mentioned in literature, and only the general neglect of these smaller Ichneumonidae in Britain makes one hesitate to surmise that this species belongs to some such group as the Phaeogenides.

12. *niger*, Bridg.

Exochus niger, Bridg. Trans. Ent. Soc. 1883, p. 169, ♀; cf. *lib. cit.* 1887, p. 375. *Triclistus niger*, Thoms. Deut. Ent. Zeit. 1887, p. 206, ♀.

A black species, with only the tarsi and tibiae red. Head shining and subquadrate, constricted posteriorly, with sparse puncturation and white pubescence; frontal impressions transverse and very superficial; mouth ferrugineous. Antennae beneath and base of flagellum ferrugineous. Thorax with sparse white pubescence; mesonotum evenly punctate throughout; metathorax with three areae. Abdomen with sparse white pubescence; the whole disc glabrous and nitidulous and that of the second and third segments nude; second segment longer than broad, third subquadrate. Legs stout and black with the tibiae, tarsi and apices of all the femora ferrugineous. Wings with no areolet; radix and tegulae ferrugineous, stigma and nervures black; nervellus intercepted below its centre. Length, 5 mm. ♀ only.

Thomson says the areolet is only "interdum aperta," but Bridgman is twice distinct with "no areolet"; the former adds that it is very similar to *E. aethiops*, Grav., differing in the pale tibiae and tarsi, the internal hind calcaria longer than half the metatarsi and the external almost longer than the apical breadth of their tibiae. This species and *Triclistus facialis*, Thoms., which differs in its pale femora, are the only two which appear to me to represent the genus *Amesolytus*, Först.

The type was captured at the beginning of August, 1882, in the neighbourhood of Norwich and is in the Castle Museum there; it has also been found in Sweden. In the middle of June, 1907, I took a ♀ at Matley Bog in the New Forest which must be regarded as a variety of this species, from which it differs only in having the hind tibiae black with a central white band, the antennae immaculate and anterior femora dull red; it is remarkable in the terebra reaching distinctly beyond the anus.

13. *squalidus*, Holmgr.

Exochus squalidus, Holmgr. Sv. Ak. Handl. 1855, p. 319, ♀; Brisch. Schr. Ges. König. 1871, p. 101, ♂ ♀ (*nec Voll.*). *Triclistus squalidus*, Holmgr. Ofv. 1873, p. 60; Thoms. Deut. Ent. Zeit. 1887, p. 203, ♀.

A shining, black, punctate and shortly pubescent species. Head somewhat constricted posteriorly; vertex deplanate and not emarginate; face protuberant, convex, punctate and elongately pubescent; frons punctate, canaliculate, anteriorly impressed on either side and centrally carinate; palpi pale testaceous. Antennae a little longer than half body, filiform, nigrescent and below rufescent. Thorax stout, a little broader than head with the mesonotum sparsely punctate and notauli wanting; propleurae

basally glabrous; metapleuræ basally elevated and sparsely punctate; costulae distinct, "interdum tamen subobsoleta"; areola twice longer than broad, and supracoxal areae glabrous. Abdomen shining, black and pubescent; first segment a little constricted basally, with carinae extending to its centre. Legs of ♂ sometimes entirely red, but usually the anterior red with coxae black and the hind ones infusate with tarsi and base of tibiae paler; femora stout. Wings slightly infumate, with the areolet entire and sessile; stigma nigrescent, radix and tegulae stramineous. Length, 6—7 mm.

Holmgren considers this species distinct in its stout conformation, less basally produced head and more or less distinct costulae; and Thomson in its large size, convex body, subinfumate wings, elongately postfurcal lower basal nervure, large areolet which emits the recurrent nervure beyond its centre, and the colour of the legs which he considered pale throughout. It is the only British *Exochus* with both areolet and costulae.

This species has been recorded rarely from Germany, France and Sweden at the end of July. Marshall introduced it as British in his 1870 Catalogus, doubtless on the strength of the four specimens in his collection from Manchester, Grovely Wood near Salisbury, Botusfleming in Cornwall, and Dulwich on 5th June. Bignell bred it on 4th July from the Pyralid moth, *Botys terrealis*, in Devonshire. But I have seen no *Exochus* with both costulae and areolet, a feature also found only in *Triclistus areolatus* and *T. albicinctus*, Thoms.

14. *gravipes*, Grav.

Ichneumon gravipes, Gr. Mem. Ac. Sc. Torin. 1820, p. 384, ♀. *Exochus gravipes*, Gr. I. E. ii. 351; i. Suppl. 693; Steph. Illus. M. vii. 267; Ratz. Ichn. d. Forst. i. 124; Fonsc. Ann. Soc. Fr. 1849, p. 237; Holmgr. Sv. Ak. Handl. 1854, p. 79; lib. cit. 1855, p. 310, pl. ix, fig. 20; Ofv. 1873, p. 63; Brisch. Schr. Ges. König. 1871, p. 99; Schr. Nat. Ges. Danz. 1878, p. 107; Voll. Pinac. pl. viii, fig. 6; Thoms. Deut. Ent. 1887, p. 207, ♂ ♀. *E. prosopius*, Holmgr. Sv. Ak. Handl. 1854, p. 79; lib. cit. 1855, p. 310, ♂; Brisch. Schr. Ges. König. 1871, p. 99, ♂ ♀ (nec Grav.).

A shining, punctulate and pubescent species. Head somewhat constricted posteriorly; face protuberant, pubescent, black and strongly punctulate; eyes slightly emarginate above antennae; genal margin slightly dilated and reflexed below base of mandibles; frons finely punctate and impressed on either side in front; palpi testaceous, vertex with small pale lateral dots, ♂ with the face usually flavous above. Antennae nigrescent and subfiliform though apically attenuate, of ♀ half length of body and in ♂ somewhat longer; flagellar joints not strongly discreted, the first half as long again as the transverse second. Thorax stout and black, twice longer than high with the pleurae sparsely punctate and speculum glabrous; notauli distinct; interpectoral sulcus broad between intermediate coxae and apically subtruncate; areola broad and hexagonal with the basal area often distinct; costulae strong, spiracles large and oval. Scutellum subdeplanate, immaculate and margined nearly to its centre. Abdomen black and apically subsericeous, a little longer and narrower than the head and thorax with segments two to five subparallel-sided or in ♀ subexplanate beyond the centre; basal segment slightly dilated apically, shining and laterally punctulate with the carinae extending to its centre in ♂, rather shorter in ♀; second segment discally glabrous and laterally finely punctate; terebra concealed. Legs

stout and pale red with the coxae and trochanters black, the latter usually apically red, and the hind tibiae basally a little paler; intermediate calcaria nearly equal in length; hind tarsi testaceous; ♂ with the anterior coxae often testaceous beneath. Wings slightly clouded with the stigma and radius infusate, radix and tegulae piceous with the latter externally stramineous; radial nervure apically straight and the basal exactly continuous through the median, with the lower basal less oblique than usual. Length, 6—8 mm.

At once known from all other species of *Exochus* by its black abdomen and exactly continuous basal nervure; *E. gravis* differs only in the colour of the legs and abdomen; *E. britannicus* mainly in the much longer carinae of the basal segment.

VAR. *INCIDENS*, Thoms. [*Exochus tardigradus*, Holmgr. Sv. Ak. Handl. 1855, p. 315, ♂ (*nec*. Grav.); *E. incidens*, Thoms, Deut. Ent. Zeit. 1887, p. 208; cf. Opusc. Ent. xix, 2131, ♂ ♀.]

Thomson describes this as a species, not yet known in Britain, distinct from *E. gravipes*, entirely on the strength of the pedal colouration, which is more flavescent, and of the ♂ face, which he says is entirely pale. It cannot be more than a variety of the present species, however, since on June 7th, 1902, I took on hawthorn blossom near Wicken Fen in Cambs., three males of which two have the face entirely and one only basally flavous; they were taken in company and are certainly co-specific. This, and not the true *E. tardigradus* of Grav., is the species introduced as British by Marshall in 1870.

E. gravipes occurs throughout Europe. It is found upon umbelliferous flowers in July, August and October in Germany, where Ratzeburg bred it from *Hyponomeuta padella* in July, and Brischke from larvae of *Tinea consociella*; it is not infrequent in damp meadows in Sweden in August; and Dalla Torre says that Vollenhoven bred it from the destructive beetle, *Dermestes vulpinus*, though upon what authority I know not. Hope took a male about Netley with the mandibles except apically stramineous, a whitish transverse facial line below antennae, the tegulae and a callosity before radices also white (Grav.); taken in June and July, near London (Stephens); specimens in Marshall's collection are from Cornworthy and Bishops Teignton in Devon, Botusfleming in Cornwall and St. Albans; but Bridgman does not appear to have known the species, which is certainly rare with us, since besides the males mentioned above I possess but three females in Capron's Surrey collection and a single fine male, swept by Elliott on 20th August, 1907, from herbage by the Tay at Birnam in Perth, opposite Dunkeld. Heysham had a specimen, probably from the Carlisle district.

15. *gravis*, Grav.

Exochus gravis, Gr. I. E. ii. 354, ♂; Thoms. Deut. Ent. Zeit. 1887, p. 208; O. E. xix. 2131, ♂ ♀.

A black species with the abdomen centrally bright brick red; tibiae and tarsi entirely red with the hind femora, except basally, and the apices only of the anterior concolorous; tibiae not basally paler; basal area confluent with areola; carinae of basal segment extending only to its centre; wings slightly infumate with the tegulae and radix infusate; nervellus distinct. Length, $5\frac{1}{2}$ — $6\frac{1}{2}$ mm.

Gravenhorst knew only two German males, taken in June and July; Thomson says it also occurs in France and Denmark. It has stood in the British list since 1856, and Bignell records it from Bickleigh in Devon on 18th May. I possess but a single male, which was swept from heather by the Rev. F. D. Morice, when we were collecting at Brockenhurst on 29th August, 1901.

16. *Britannicus*, *sp. n.*

A somewhat stout black species with vertical lunulae behind the posterior ocelli, upper margin of propleurae throughout, sides and apex of scutellum, apex of postscutellum and the frenum narrowly, flavous; abdomen shining, punctate and black with the incisures of the three basal segments narrowly, or also nearly whole of second segment, bright brick red; tibiae, tarsi and whole of femora clear red, with base of all the tibiae flavescent; basal area discreted from areola; carinae of basal segment very strong and extending to apex; wings distinctly infumate with tegulae entirely and radius flavescent to base of stigma; nervellus obsolete. Length, 7 mm. ♀ only.

Differs from all other *Exochi* in having the basal nervure continuous through the median, combined with the carinae of basal segment extending to its apex.

I have seen two females of this species, which is certainly not the alternate sex of the last described, and both are from Suffolk; the type was captured on the flowers of *Daucus carota* at Tuddenham on 29th August, 1902; the other was taken about the same time by Mr. W. H. Tuck, M.A., at Bungay. With the type occurred a specimen agreeing in every way excepting that the basal nervure is distinctly postfurcal below the median; and if they be regarded as conspecific we may, with equal propriety, consider *E. prosopius* a mere form of *E. gravipes*.

17. *prosopius*, *Grav.*

Exochus prosopius, Gr. I. E. ii. 349; Steph. Illus. M. 267; Voll. Pinac. pl. viii, fig. 7, ♂; Thoms. Deut. Ent. Zeit. 1887, p. 209; cf. O. E. xix. 2132 et Buysson, Rev. Ent. 1892, p. 258 (*nec* Holmgr. et Brisch.). *E. procerus*, Holmgr. Ofv. 1873, p. 68, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 107, ♂. (?) *E. maculatus*, Brisch. Schr. Ges. König. 1871, p. 100, ♂.

A shining black species, with the legs nearly entirely red. Head with the palpi and dots at vertical orbits pale; ♂ with face, cheeks and most of mandibles, ♀ always with a facial fascia below the antennae, bright flavous. Antennae apically attenuate, with the scape pale beneath. Thorax always with an often elongate pale callosity before radix and flavous line on apical margin of mesopleurae, ♂ also with large apical mesosternal concolorous mark; notauli very distinct and subpunctiform; costulae stout in both sexes. Scutellum with one or two apical flavidous marks, sometimes laterally produced to centre; postscutellum also rarely pale-marked. Abdomen immaculate and not very strongly punctate, ♀ with disc of second segment not at all punctate; pubescence distinct. Legs flavidous with femora fulvescent; extreme apices of hind tibiae, the tarsal claws and sometimes upper side of their trochanters infusate; coxae of ♀ entirely black, hind ones of ♂ concolorous above; calcaria

elongate, the hind internal nearly reaching apical third of metatarsus, the external not or hardly shorter than breadth of its tibial apex. Wings slightly clouded, stigma and radius infuscate; radix and tegulae pale flavous, the latter in ♀ internally infuscate. Length, 7—7½ mm.

Known by its postfurcal basal nervure, distinct notauli, outer hind calcar as long as apical breadth of tibia, entirely pale ♂ face, ♀ immaculate frontal orbits and pale facial fascia. The ♂ is similar to that of *E. gravis*, but with the abdomen a little stouter and immaculate; the ♀ is like that of *E. consimilis* but has the second segment laterally more distinctly and coarsely punctate and flavidous anteradical callosities always present; the areola is apically rounded and ♂ face broader. It is of the structure and almost the size of *E. gravipes*, but the intermediate calcaria are strongly unequal in length, the lower basal nervure very evidently postfurcal, the ♀ has a sometimes laterally abbreviated facial fascia and the ♂ has the mouth and face and anterior coxae and nearly always apex of the scutellum pale flavous.

Certainly this species is not very frequent with us. Not common about London in June (Stephens); Exeter in the middle of August (Bignell); Tarrington in Hereford in August (Yerbury); bred from a species of *Tortrix* by Butler (Entom. 1881, p. 141). I have several specimens found about Felden in Herts and Shere in Surrey by Piffard and Capron; Tuck took it at Tostock in Suffolk during June, 1900, and it has occurred to me on a window-pane at Blakenham in the same county in mid-August, at Lyndhurst in the New Forest early in August, and, dead, in a greenhouse at Ryde, Isle of Wight, in October. Bridgman does not mention this species from Norfolk, but says that *E. consimilis*, Holmgr., with which Thomson erroneously synonymized it in 1887, has been captured at Bawsey Heath by Atmore and bred from *Homocosoma nimbella* by W. Fletcher; it has also been reared from *Pionia olivatis* in France.

18. *nigripalpis*, Thoms.

Exochus nigripalpis, Thoms. Deut. Ent. Zeit. 1887, p. 209; O. E. xix. 2132, ♂ ♀.

Black. Antennae filiform and somewhat elongate; notauli distinct; costulae stout. Femora and tibiae red, hind tarsi nigrescent and ♀ coxae black. Length, 6—7 mm.

A little smaller than *E. gravipes* with the vertical pale dots sometimes obsolete and differing in the much shorter intermediate calcaria, usually entirely black tegulae and slightly postfurcal basal nervure. From *E. prosopius* it may be known by the antennae not being apically attenuate, the apical nervure apically slightly curved, the calcaria shorter, ♂ face and scutellum black with the former at most sometimes pale above. With *E. consimilis*, Holmgr., which is only known as British from Bridgman's record (supra) doubtless referring to the present species, it agrees in having the vertex short and constricted posteriorly, the face not strongly punctate, the vertical pale dots small or obsolete, the antennal flagellum slender and somewhat elongate, the femora and tibiae red with ♀ coxae black, stigma narrow and the radial nervure neither elongate nor quite straight; but Thomson says it differs in such trivial points as the apically paler palpi, slightly longer notauli, apically paler hind tarsi, pale-marked tegulae and more broadly punctulate ♂ second segment; I consider them

quite possibly synonymous, especially as Thomson did not know the true *E. consimilis* when erecting his *E. nigripalpis*.

The present is said to be a common species with us by Bridgman, in introducing it as British (Trans. Ent. Soc. 1887, p. 375). He records it commonly from Norfolk, and Bignall took it at Bickleigh in Devon early in September; but I have found only two specimens, on flowers of *Angelica sylvestris* in the marshes about Beccles on 13th August, 1898, and by sweeping reeds at Easton Broad on the coast of Suffolk on 23rd September, 1900, and 5th June, 1905.

19. *flavomarginatus*, Holmgr.

Exochus flavomarginatus, Holmgr. Sv. Ak. Handl. 1854, p. 80, ♂; *lib. cit.* 1855, p. 311; Ofv. 1873, p. 64; Voll. Pinac. pl. viii, fig. 8; Brisch. Schr. Nat. Ges. Danz. 1878, p. 107; Thoms. O. E. xix. 2133, ♂ ♀. *E. flavolimbatus*, Thoms. Deut. Ent. Zeit. 1887, p. 209, ♂ ♀.

Head black with a pale lunule between the antennae; the vertical dots somewhat broadly, the lower half of the frontal orbits and whole or part of the external distinctly, stramineous; cheeks somewhat elongate. Antennae black and apically attenuate; of ♂ ferrugineous. Thorax black with a pale callosity before radix; notauli small and distinct; metathoracic spiracles oval, costulae stout and areola discreted from basal area. Scutellum flavous-margined. Abdomen shining with carinae of basal segment not elongate; the second subtransverse with its disc glabrous and sides finely punctate; ♂ with the second, third or fourth segments to seventh laterally stramineous. Legs red with tarsi of ♀ entirely concolorous and of ♂ stramineous; all coxae red; internal intermediate calcar less than double length of the external, hind ones not short. Wings slightly clouded with the stigma pale; radius with the apical abscissa slightly curved and much longer than the arcuate basal; fenestrae small; radix and tegulae whitish. Length, $5\frac{1}{2}$ — $7\frac{1}{2}$ mm.

Known by its postfurcal basal nervure, long calcaria, distinct notauli and pale frontal and external orbits, combined with pale coxae and strong costulae. Thomson mentions a British variety with the meso- and metasternum laterally stramineous.

This is certainly one of our commonest species, and is found throughout northern and central Europe. It was known to Marshall as British; Bridgman records it from Norwich, Brundall and Kings Lynn, in Norfolk; Bignell from Bickleigh in Devon, early in September; he also took it at Ivybridge and Clearbrook in July and August, 1890; and Marquand from the district of Lands End. I have some thirty specimens captured at the New Forest (Miss Chawner); Lynton in Devon in 1890 (Stanley Edwards); Nairn and Woolhope, early in June, 1902 (Yerbury); Lynhurst, in May and June (Adam); and Bury St. Edmunds in the middle of June (Tuck). It has occurred to me indifferently on birch and hazel bushes in woods at Bentley and Assington, in Suffolk, on bracken at the Wilverley Inclosure in the New Forest and in marshes by sweeping and on the flowers of *Daucus carota* and on sallow in the Brandon marshes, Barnby Broad and Tuddenham Fen from 18th May to 19th June, and during the latter half of August. Our only knowledge of its economy is furnished by W. H. B. Fletcher's rearing of it from *Eudorea truncicolella*, probably at Worthing (Entom. 1884, p. 71).

20. *pictus*, *Holmgr.*

Exochus pictus, Holmgr. Sv. Ak. Handl. 1855, p. 312; Ofv. 1873, p. 66; Brisch. Schr. Ges. König. 1871, p. 100; Thoms. Deut. Ent. Zeit, 1887, p. 210; O. E. xix. 2133; Szep. Term. Füz. 1900, p. 10, ♂ ♀.

A black species with the femora and tibiae red, the orbits nearly entirely white and the areola confluent with the petiolar area; costulae sometimes obsolete; stigma infusate, radix and tegulae pale stramineous; coxae and trochanters black, with the anterior of ♂ stramineous. Length, 6—7 mm.

Very similar and closely allied to *E. flavomarginatus* in size, conformation and the length of the intermediate calcaria; but with the stigma darker, the posterior orbits nearly entirely and the frontal throughout stramineous, the hind coxae and trochanters deep black or at most apically ferrugineous, the areola confluent with petiolar area, the radial nervure longer and but slightly curved, the abdomen dilated towards its apex with the basal segment longer and the second quadrate, the scape pale-marked beneath, the ♀ face black with a fascia above, a genal mark and the mandibles stramineous, the ♂ with face and mouth entirely flavescent.

It has been found in Germany, Hungary and Sweden in July. Bridgman recorded it as British (Trans. Ent. Soc. 1883, p. 170) on the strength of a single female taken at Thornhill; Bignell mentions it from Bickleigh in Devon on 30th August; I have recorded the male from Park in Scotland, early in July (E. M. M. 1910, p. 37); Mr. Stanley Edwards took one at Lynton, Devon, in 1890; Marshall another at Grovely Wood, near Salisbury; on 8th June, 1904, Mr. Brockton Tomlin sent me a female from Cannock Chase; and Rev. W. F. Johnson has found another at Mulranny in Co. Mayo.

21. *erythronotus*, *Grav.*

Ichneumon erythronotus, Gr. Mem. Ac. Torin, 1820, p. 384, ♀. *Exochus erythronotus*, Gr. I. E. ii. 355; Holmgr. Sv. Ak. Handl. 1855, p. 314; Ofv. 1873, p. 65; Brisch. Schr. Ges. König. 1871, p. 100; Schr. Nat. Ges. Danz. 1878, p. 107; *E. coronatus*, var. *erythronotus*, Kwall, Stett. Ent. Zeit. 1858, p. 67; Thoms. Deut. Ent. Zeit. 1887, p. 211, ♂ ♀. *E. coronatus*, Gr. I. E. ii. 342; Steph. Illus. M. vii. 266; Zett. I. L. i. 379; Thoms. O. E. xix. 2134, ♂ ♀. (?) *E. pectoralis*, Hal. Ann. Nat. Hist. 1839, p. 113, ♂.

Head with the face somewhat finely punctate and (in form typ.) more or less broadly rufescent; half the frontal orbits, a large vertical dot and usually a facial fascia, flavescent; cheeks elongate with the sulci fine but distinct, and costa inflexed. Antennae of ♀ short, stout and attenuate at both extremities, of ♂ longer and subfiliform. Thorax (in form typ.) mainly red with a line before and callosity below radices whitish; costulae distinct or obsolete, areola not elongate, spiracles subcircular. Scutellum (in form typ.) red; its apex always, together with postscutellum, pale. Abdomen black or (in form typ.) red-marked; basal segment with carinae short, the second somewhat closely punctate and discally glabrous. Legs red with the hind tibiae basally whitish and their coxae sometimes basally nigrescent. Wings with radial nervure apically a little curved. Length, 3—6 mm.

The typical form is at once recognised by its profuse red markings and the var. *coronatus*—hitherto erroneously accorded precedence—by its immaculate posterior orbits, apically pale scutellum, and pale frontal orbits.

[It is impossible to ascribe Haliday's species (which has the areolet wanting; facial orbits, sternum and anterior legs flavous; hind legs fulvous with the whitish tibiae and tarsi apically infusate) to any of our descriptions with certainty; I know none with facial orbits alone pale. It was captured at Eyrecourt in Galway during September.]

Certainly uncommon with us, though Stephens records it from Coombe Wood, the New Forest and Shropshire, in June. Beaumont gave me a male, taken at Blackheath in July, 1897; but I have only met with the females at Ryde in the Isle of Wight, where, however, newly dead specimens were not rare in a greenhouse during September, 1900, and October, 1901. Van Burgst has taken both forms about Breda in August.

22. *decoratus*, Holmgr.

Exochus decoratus, Holmgr. Ofv. 1873, p. 64, ♀; Thoms. Deut. Ent. Zeit. 1887, p. 213, ♂ ♀; cf. O. E. xix. 2135 et Szep. Rovart. Lapok. 1898, p. 60. (?) *E. lictor*, Hal. Ann. Nat. Hist. 1839, p. 113, ♀.

A shining black species with profuse pale markings. Head in both sexes with the mouth, whole cheeks, face, frontal orbits broadly flavous and confluent with the concolorous vertical marks; cheeks short, mandibles transversely impressed discally before their base; frons obliquely impressed on either side with a subdeterminate triangular central elevation. Antennae elongate and filiform; flagellum fulvescent, scape flavous, beneath. Thorax with a triangular callosity before, a line below radix and a large transverse mesopectoral mark, flavous; sternum laterally red, pleurae and rarely mesonotum discally concolorous; costulae usually strong, areola apically dilated, spiracles subcircular. Scutellum discally and postscutellum flavous. Abdomen with carinae of basal segment elongate and the second discally impunctate. Legs stramineous with the hind coxae and femora fulvous; hind tibiae whitish with the extreme base and above at apex black, their tarsi pale with the joints apically fulvidous and claws black. Wings with stigma infusate, radix and tegulae whitish. Length, $6\frac{1}{2}$ mm.

Our only species with short hind calcaria and pale frontal orbits.

Bridgman introduced it as British on the strength of a single male, which was captured at Preston (Trans. Ent. Soc. 1882, p. 160) and I possess a couple of broken specimens in Capron's Surrey collection. It is apparently everywhere rare and Holmgren knew but a single Swedish male. I believe Mr. Malloch has, also, taken a single male at Bonhill, Dumbarton. Haliday's description is too short to render the synonymy certain; his type came from the Isle of Wight.

23. *alpinus*, Zett.

Bassus alpinus, Zett. I. L. i. 379, ♀. *Exochus alpinus*, Holmgr. Sv. Ak. Handl. 1855, p. 311; Ofv. 1873, p. 75, ♀; Brisch. Schr. Ges. König. 1871, p. 99; Thoms. Deut. Ent. Zeit. 1887, p. 214, ♂ ♀.

Head posteriorly constricted; face partly pale; frons very finely but obviously punctate, with the scrobes not extending to ocelli and orbits

immaculate; cheeks very short. Antennal flagellum ferrugineous, nearly entirely black above. Thorax immaculate, with the areola somewhat broad and the costulae strong or obsolete. Scutellum black. Abdomen with the basal segment deplanate and its carinae extending beyond the centre; the second transverse. Legs red with the coxae and trochanters black; hind tibiae nigrescent with a white band near their base, their tarsi white with the joints becoming gradually more determinately black apically. Wings somewhat infumate with the stigma infusate-testaceous and tegulae dark-marked. Length, 6 mm.

Known by the short calcaria, immaculate frontal orbits and scutellum, and the black-and-white hind tibiae and tarsi.

Bignell bred this species in Devon on 4th May from a black larva of some *Tortrix* (probably *T. xylosteana*) feeding on honeysuckle (Entom. 1881, p. 141). I have two females bred by Dr. R. T. Cassal from pupae of the Tortricid *Penthina dimidiana*, found feeding on *Myrica gale* at Midge Hall, near Doncaster, in 1901; in both cases the host chrysalis was cut irregularly and entirely away from its capital extremity to below the face, showing the parasite to have lain in the pupa exactly as had its host.

24. *notatus*, Holmgr.

Exochus notatus, Holmgr. Sv. Ak. Handl. 1855, p. 317; Ofv. 1873, p. 75; Brisch. Schr. Ges. König. 1871, p. 100; Schr. Nat. Ges. Danz. 1878, p. 107; Vol. Pinac. pl. viii, fig. 10; Thoms. Deut. Ent. Zeit. 1887, p. 214, ♂ ♀. Var. *E. Woldstedtii*, Holmgr. Ofv. 1873, p. 67, ♂ ♀. Var. *E. annulitarsis*, Thoms. Deut. Ent. Zeit. 1887, p. 215, ♂ ♀.

A black species with the scutellum apically pale, the legs red with both hind tarsi and tibiae white-banded. Length, 6—7 mm.

Similar in size, conformation and the pale-banded legs to *E. alpinus*, but with the flagellum infusate and a little longer, the hind tibiae ferrugineous or testaceous with their apices more broadly and the extreme base nigrescent, a white callosity before the concolorous tegulae, the postscutellum and apex of scutellum flavidous, and the coxae usually ferrugineous.

Var. *Woldstedtii*, the black bands of hind tarsi obsolete.

Var. *annulitarsis*, carinae of basal segment not extending beyond centre.

The late Mr. Alfred Beaumont has given me three specimens, taken in company, at Taynult in Scotland during September, 1894, and referred to the present species by Marshall, of which two are typically *E. notatus* and the third obviously referable to Thomson's *E. annulitarsis* and this I consequently regard as a variety of Holmgren's species, than which it is said by its author to be more slender with the hind coxae and tibiae black, the latter centrally broadly white, and the scrobes longer and deeper above the antennae. The typical form does not appear to have been noticed in Britain before, but a male of *E. Woldstedtii* is recorded by Bridgman (Trans. Ent. Soc. 1887, p. 375) from Earham near Norwich, where he took it in June, 1886.

25. *lentipes*, Grav.

Exochus lentipes, Gr. I. E. ii. 344; Steph. Illus. M. vii. 266; Fonsc. Ann. Soc. Fr. 1849, p. 235, ♀; Ratz. Ichn. d. Forst. iii. 131; Thoms. Deut. Ent. Zeit. 1887, p. 215, ♂ ♀. *E. cylindricus*, Holmgr. Sv. Ak. Handl. 1855, p. 317; Ofv. 1873, p. 76; Brisch. Schr. Nat. Ges. Danz. 1891, p. 62, ♀.

A black, narrow, cylindrical, elongate shining and strongly deplanate species. Head with the face of ♂ entirely, of ♀ with a fascia beneath the scrobes, flavous. Antennae black. Thorax with a linear callosity before the radices whitish; areola elongate and subparallel-sided, costulae distinct or obsolete. Scutellum apically rufescent or pale flavous. Abdomen black and narrow, of ♂ with the three basal segments laterally or apically stramineous; first segment convex with somewhat elongate carinae, the second almost longer than broad and laterally finely punctate. Legs red with the coxae sometimes piceous or even nigrescent; hind tibiae ferrugineous, with the apex and base black, the latter followed by a white band; hind tarsi whitish and not black-banded but with apices of joints becoming gradually more broadly testaceous or ferrugineous towards apex. Wings hyaline with stigma testaceous, and the curved apical abscissa of the radial nervure nearly thrice longer than the basal. Length, 5—5 mm.

This species may be recognised by its short hind calcaria, immaculate frontal orbits and peculiar pedal colouration.

It appears to have been much mixed everywhere with the next, and I have little doubt that Stephens' record "Scarce: taken in June near London," upon which alone it has been accorded a position in our List for the last seventy-five years, refers to *E. tibialis*. Certainly I have seen nothing I could refer to it, and there is no subsequent mention of it in our literature. It might, however, occur with us, since it is found in Germany and Sweden.

26. *tibialis*, Holmgr.

Exochus tibialis, Holmgr. Sv. Ak. Handl. 1855, p. 317 et 389; Ofv. 1873, p. 76; Voll. Pinac. pl. viii, fig. ix; Brisch. Schr. Nat. Ges. Danz. 1878, p. 108; Thoms. Deut. Ent. Zeit. 1887, p. 215, ♂ ♀.

Black with the legs, and most of flagellum, red; hind tibiae white with their base and apex black. Length, 4—5 mm.

Similar and closely allied to *E. lentipes*, but smaller and stouter with the hind tibiae white, basally above and apically more broadly nigrescent with no red colouration, the flagellum shorter and paler, the areola apically dilated and not so long, the metathoracic spiracles circular and somewhat large.

This is a common species, introduced as British by Fitch (Entom 1880, p. 258) on the strength of two specimens bred by Weston from (? *Tortrices* in) the oak galls of *Cynips Kollari*; and subsequently (*lib. cit.* 1883, p. 67) from *Stigmonota rufimitrana* by Lord Walsingham. Bridgman took it at Mousehold, Earlham and Brundall in Norfolk, and adds that Fletcher bred it from *Gelechia populella*; doubtless Ratzeburg's record of *Exochus lentipes*, from the same species of *Tinea*, refers to the present insect. Piffard and Capron found it in Hertfordshire and Surrey, Elliott at Monks Soham, Tuck at Tostock in Suffolk and Chippenham Fen in Cambridgeshire during July and September; it has occurred to me on *Heracleum* Flowers, on reeds at Filby Broad in Norfolk and Tuddenham Fen in Suffolk, and on bracken at Wilverley and Lyndhurst in the New Forest, from the middle of June to the middle of August.

27. *Fletcheri*, Bridg.

Exochus Fletcheri, Bridg. Trans. Ent. Soc. 1884, p. 432; Thoms. Deut. Ent. Zeit. 1887, p. 216, ♂ ♀.

Head glabrous, nitidulous and posteriorly constricted; face coarsely punctate, of ♂ except centrally, of ♀ with a fascia below the scrobes, flavous; vertical dots, which are at some distance from the eyes, and ♂ cheeks flavous. Antennae half length of body, with flagellum nigrescent throughout. Thorax immaculate; metathorax short with the areola apically distinctly explanate, emitting the obsolete costulae beyond its centre, at least in ♂. Scutellum black and subdeplanate. Abdomen somewhat coarsely punctate; basal segment glabrous, not longer than broad, laterally margined and bicarinate to centre; the following segments transverse, with the second convex and closely punctate. Legs fulvous, with the coxae black and trochanters nigrescent; tibiae red with their extreme base whitish; apices of the hind tarsal joints, and base of the first, infusate. Wings with radices flavous, stigma nigrescent, the brachial cell subrectangular apically and nervellus intercepted below its centre. Length, 5 mm.

This species, distinguished from the foregoing by the colouration of its hind tibiae, is allied to *E. frontellus*, Holmgr., but is smaller with no pale callosity before the radices; it is similar in conformation to *E. erythronotus*, though distinctly smaller. Thomson transposed the sexes of Bridgman's description.

Two males and a female, doubtless in the Norwich Castle Museum, were bred by W. H. B. Fletcher from larvae of *Gelechia notatella*, taken in Wicken Fen (cf. Entom. 1884, pp. 69—71). I beat two males from oak in marshes at Reydon and Walberswick, near Southwold, on 5th and 11th September, 1910; and possess a female bred from *Tortrix fuligana* by C. G. Barrett.

28. *parvispina*, Thoms.

Exochus parvispina, Thoms. Deut. Ent. Zeit. 1887, p. 216.

A black species with the whole of the legs, except the coxae and the trochanters, red. Length, $5\frac{1}{2}$ —6 mm. ♂ ♀.

This is a somewhat narrow and featureless species, easily known by negative characters: the face is immaculate black, the vertical pale dots are very small, the femora and tibiae are all entirely clear red, rarely with a black mark beneath the front femora. Thomson, who does not indicate his sexes, says its conformation is similar to that of *E. coronatus*, though its size is smaller. It is extremely liable to be mixed with the red-legged *E. prosopius* group of species, from which its very short external hind calcaria distinguish it.

Hitherto it has only been noticed from Sweden, though probably not rare with us; I have two examples of both sexes. Beaumont took the male at Kidbrook at the end of July, 1897, and the female at Harting in Sussex at the end of August, 1899; I found a female by sweeping reeds on the margin of a pond in the Bramford marshes near Ipswich on 11th October, 1899, and a male in Tuddenham Fen, Suffolk, in the middle of August, 1906.

29. *septentrionalis*, Holmgr.

Exochus septentrionalis, Holmgr. Ofv. 1873, p. 72; Thoms. O. E. xix. 2137, ♀.
(?) *E. septentrionalis*, Bridg. Trans. Ent. Soc. 1882, p. 160, ♂.

♀. A stout shining black species. Head somewhat constricted posteriorly, with the vertical dots flavidous; frons impressed in front on either side, with the central triangular elevation indeterminate and orbits immaculate. Metathoracic costulae obsolete. Abdomen with first segment broad and but shortly carinate; the four basal segments obsoletely punctate. Legs black with the hind femora entirely, the anterior apically and the tibiae red; hind tibiae infusate at their extreme base; all femora strongly incrassate; external hind calcaria short. Wings with the stigma pale infusate, radix infusate-testaceous and tegulae nigrescent; basal nervure not continuous. Length, 6 mm.

♂. Differs from the above description only in having the red femora apically black; the front tibiae and tarsi rufescent with their apices black; the intermediate tarsi nigrescent; and the coxae and trochanters piceous or badious, with the latter apically red.

Holmgren knew two females from southern Lapland and Bridgman two males, which he thought might perhaps constitute the alternate sex of this species, from Clober and Cadder in Scotland; but the association of the sexes is very doubtful and the inclusion of Holmgren's species as British consequently needs confirmation. I have seen nothing like it. It is said to be similar to *E. Fletcheri* and *E. punctus*, Holmgr., but of stouter conformation with the hind femora entirely red.

30. *albicinctus*, Holmgr.

Exochus albicinctus, Holmgr. Ofv. 1873, p. 71, ♂; Thoms. Deut. Ent. Zeit. 1887, p. 217, ♂ ♀; cf. Bridg. Trans. Ent. Soc. 1882, p. 160.

A nitidulous, black species with the legs mainly concolorous, and hind tibiae basally white. Head, including the mouth, entirely black or with a small pale fascia below the scrobes; vertex broad, but declived behind eyes; cheeks compressed, with costa continuous; mandibles a little narrowed apically, with the teeth of equal length. Antennae and thorax black; areola apically dilated, with the costulae of ♂ emitted beyond its centre and of ♀ obsolete. Scutellum immaculate. Abdomen black with carinae of basal segment extending a little beyond its centre, and the three following segments finely and sparsely punctate. Legs unusually dark; femora black with the front ones except basally, the posterior at their apices, red; the hind ones sometimes centrally subrufescent; tibiae red with the hind ones broadly at their apices and narrowly before the basal white band nigrescent; tarsi dull testaceous; calcaria not very short, white with apices of the hind ones black. Wings with stigma infusate, and the lower basal nervure but very slightly potstfural. Length, $5\frac{1}{2}$ —6 mm.

Remarkable for its immaculate vertex and black femora; and differs from *E. niger*, Bridg., in its distinctly infusate hind tibiae, punctate abdomen and darker mouth, though it appears extremely closely allied in all salient characters.

Bridgman first discovered the female sex, at Wimbledon in Surrey during July, 1881, and says that in this example the hind tibiae were not

at all red-marked; the male he took at Felthorpe in Norfolk during the preceding month. It is only recorded elsewhere from Sweden, but is certainly not rare with us; and I have specimens taken at Nunton in Wilts. by Marshall and at Shere in Surrey by Dr. Capron. I met with it during four consecutive years, 1899—1902, in such varied localities as Felixtowe on the Suffolk coast, Kirtling in Cambridgeshire, by sweeping after dark at Winterton in the Norfolk Broads, and in the middle of Wicken Fen; it appears to be attracted to the flowers of *Heracleum sphondylium* as soon as they first open, about the 13th June, during which month alone I found it.

ORTHOCENTRINI.

Head transverse or more often buccate, more or less emarginate posteriorly, with the vertex narrow or somewhat broad behind the eyes; face more or less distinctly protuberant below the antennae, convex and sometimes centrally deplanate; clypeus not or very obsoletely discreted. Antennae filiform, shorter and stouter in ♀; scape elongate. Thorax gibbulous, with both sternaui and notauli obsolete; pleurae usually very smooth; metathorax distinctly areated or with the areola entirely wanting; petiolar area nearly always complete and costulae always wanting. Scutellum somewhat convex. Abdomen oblong and in ♀ more or less apically compressed and basally sessile; basal segment never elongate, more or less entirely aciculate or alutaceous, and unevenly impressed; seventh short and rarely as long as the preceding; terebra either sub-concealed and reflexed or distinctly exerted and straight. Anterior legs normal, the hind ones subelongate and stout with their coxae compressed; pulvilli elongate and onychium stout. Wings not very broad nor ample; radial cell short; areolet either pentagonal, subtrigonal or entirely wanting. The size is never large, but some of the species are among the smallest of all Ichneumonidae, ranging from but one-and-a-half to at the most five millimetres.

No doubt can still be entertained that this group is very closely allied in the structure of its head with the *Exochides*, with which Ashmead considered it to have been "confounded," though he could bring forward no better distinctions than the single one of its longer scape; and yet few features are available by which to separate it from the Ophionid *Plectiscides*, since the terebra is occasionally distinctly exerted, but the best of these is undoubtedly, as Thomson points out (O. E. 2420), the elongate-cylindrical scape.

Holmgren (p. 323) that the members of this group usually oviposit in larvae of Microlepidoptera; and in this Thomson concurs (O. E. 2421) but adds to their hosts the "svampinsecter" (? Cynipidae). It will, however, be seen from the following details that Longicorn and Heteromorous Coleoptera, Sawflies and Mycetophilid Diptera are also recorded hosts. I consider it most probable that they are attached to the *Mycetophilidae* and that the beetles, etc., which have emerged from the same pabulum, have been mistaken for hosts. This would relate them in their economy with *Bassus*, under which Gravenhorst placed them; though we do not yet know if the parasitism be external.

Gravenhorst, who was peculiarly ignorant of this group, gives one species as British, and Westwood in 1840 professes to a knowledge of seven, giving *Orthocentrus anomalus*, Grav., as type of the genus; but Des-

vignes instanced only three in 1857, including *O. laricis*, Hal. Of these the other two were *O. anomalus*, Grav., and *O. incisus*, Grav. (Cat. 91); it is difficult to understand what he wished to convey by these names, however, since he placed two males of *O. marginatus*, Holmgr. (1855) and a male of some *Plectiscid* under the former name (a headless male of the former is also labelled "*anomalus*" in Stephens' writing); while under the latter he placed a medley of ♂ *O. fulvipes*, ♀ *S. laricis* and *S. intermedius*. Marshall instanced eleven species in 1872, of which five were not known to Thomson, but I think there can be no doubt that the positions here assigned to them in his grouping are correct, though M. de Gaulle places *O. cognatus*, Holmgr., in the subgenus *Orthocentrus*; *O. spurius* is almost a nomen nudum, but doubtless referable to the same section, and said by Haliday, in his MS. diary which I have seen in the Dublin Museum, to have been taken commonly by him in Ireland; *O. laricis* is quite certainly synonymous with *S. fortipes*, Thoms.; *O. binotatus* cannot be far removed from *S. silvaticus*; while *O. incisus*, Grav., is practically unrecognizable and we have no true right to it as British. The genus *Neurateles*, Ratz. (Ichn. d. Forst. ii. 86) is now generally conceded to belong to the Orthocentrini, though placed by Marshall at the end of the Ophioninae, among such aberrant genera as *Collyria* and *Exetastes*; Bridg.-Fitch omit it and point out (Entom. 1884, p. 123) that Ratzeburg describes none of the present group, hence the probable synonymy, and Thomson indicates it as identical with his first section of *Stenomacrus*, of which I am not aware that we possess any representatives in Britain, though Haliday told Marshall that he had discovered *N. papyraceus*, Ratz., here (and a MS. note of his in the Dublin Museum indicates that he found it commonly in Ireland); but the description is too short to recognise the species.

Bridgman paid very little attention to this group, brought forward no new indigenous species and only records three and a fourth doubtfully from Norfolk (Trans. Norf. Soc. 1893, p. 628), adding "I have several other species of this genus, but from the great difficulty there is in identifying these very small Ichneumons I prefer to leave the doubtful species out of the list." He appears, however, to have subsequently paid some attention to the subject, since Bignell's records (Trans. Devon. Assoc. 1898, p. 499) show almost the only additions we have had since 1872, and include six species. All the latter's Ichneumonidae were named by Bridgman, and such as he failed to determine in this group (some seventy examples) were presented to me by Bignell in 1903; Marshall also gave me those he could not name; and I have had the advantage of examining the specimens from Stephens', Desvignes', Smith's and Marshall's collections in the British Museum.

In order to adequately work out the three hundred and fifty specimens in my own collection and the sixty in the Museum, I have found it necessary to tabulate the whole of those instanced by Thomson and to amplify his meagre characters by the fuller descriptions of Holmgren and Brischke. The task was not light, but the result must be regarded as satisfactory, since I have no hesitation in stating that the following table is far more lucid and contains more definite characters than I had dared to expect before approaching the subject. Doubtless other species will be found in Britain, and specimens must consequently not be forced here; Holmgren described fifty distinct kinds and these have been augmented by Brischke, Thomson and Szepligeti.

Table of Genera.

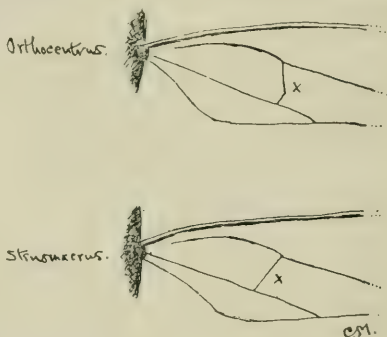
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|------|----|--|-----------------------------|
| (2). | 1. | Nervellus oblique, antefurcal, geniculate; areolet entire | ORTHOCENTRUS, <i>Grav.</i> |
| (1). | 2. | Nervellus vertical, postfurcal, entire; areolet often wanting. | |
| (4). | 3. | Hind wing with cubitus basally distinct; terebra exerted | PICROSTIGEUS, <i>Thoms.</i> |
| (3). | 4. | Hind wing with cubitus basally wanting; terebra concealed | STENOMACRUS, <i>Thoms.</i> |

ORTHOCENTRUS, Gravenhorst.

Gr. I. E. iii. (1829), 358; Thoms. O. E. xxii. 2423.

Head somewhat constricted behind the eyes, though with the vertex often broad; clypeus apically rounded and covering apices of mandibles; ♂ face always entirely pale. Antennae of ♀ apically attenuate and spiral; ♂ with basal flagellar joint elongate, linear or cylindrical. Thorax with the epicnemial fine, laterally distinct; metanotum with four longitudinal carinae and the petiolar area distinct. Abdomen with the second segment nearly always sculptured; terebra not exerted. Hind legs stout with the pulvilli usually longer than the claws. Wings with the apically straight or very slightly curved radial nervure emitted from centre of stigma, and anal nervure from below centre of the brachial cell; areolet entire; basal nervure slightly arcuate; hind wings with the nervellus oblique (not vertical), antefurcal and geniculate, usually far below centre.

The distinctly antefurcal and usually intercepted nervellus distinguishes this genus, the species of which are generally larger and stouter, with more profuse pale markings than in either of the following.

*Table of Species.*

- | | | | |
|-------|----|--|-------------------------------|
| (2). | 1. | Second segment of ♀ smooth; stigma of ♂ very large | 1. STIGMATICUS, <i>Holmg.</i> |
| (1). | 2. | Second segment sculptured; stigma of normal size. | |
| (12). | 3. | Vertex narrow; areolet rarely transverse; face not granulosely punctate. | |
| (5). | 4. | Vertical orbits pale; ♀ postannellus linear | 2. CORRUGATUS, <i>Holmg.</i> |
| (4). | 5. | Vertical orbits never pale; ♀ postannellus not linear. | |
| (11). | 6. | Frons glabrous below ocelli, of ♂ and often ♀ pale-marked. | |
| (8). | 7. | Arolet distinctly sessile; ♂ pronotum black | 3. MARGINATUS, <i>Holmg.</i> |

- (7). 8. Areolet subpetiolate; ♂ pronotum pale.
- (10). 9. Second flagellar joint of ♀ quadrate; ♂ frontal orbits pale 4. FRONTATOR, *Zett.*
- (9). 10. Second flagellar joint of ♀ transverse; ♂ whole frons pale 5. SANNIO, *Holmgr.*
- (6). 11. Frons finely punctate below ocelli, not pale marked 6. MONILICORNIS, *Thoms*
- (3). 12. Vertex broad; areolet often transverse; face often granulosely punctate.
- (16). 13. Face shorter and granulosely punctate; postannellus transverse-subtriangular; ♂ unknown.
- (15). 14. Two basal segments finely strigose, third not transverse 7. ATTENUATUS, *Holmgr.*
- (14). 15. Two basal segments coriaceous, third subtransverse 8. PETIOLARIS, *Thoms.*
- (13). 16. Face longer, not granulosely punctate; postannellus of ♀ very short; vertex broad.
- (20). 17. Stigma not infusate, or radius not basally straight.
- (19). 18. Radial nervure basally curved; stigma infusate. 9. FULVIPES, *Grav.*
- (18). 19. Radial nervure basally straight; stigma pale 10. RADIALIS, *Thoms.*
- (17). 20. Stigma infusate, and radial nervure basally straight 11. PROTUBERANS, *Holmgr.*

1. stigmaticus, *Holmgr.*

Orthocentrus stigmaticus, *Holmgr. Sv. Ak. Handl. 1855, p. 325*; *Thoms. O. E. xxii. 2424, ♂ ♀*; *Brisch. Schr. Nat. Ges. Danz. 1878, p. 108, ♂*,

Head transverse and not buccate, slightly emarginate posteriorly with the vertex narrow; frons deplanate and apically smooth; face normally protuberant, in ♂ entirely stramineous and in ♀ piceous with its upper margin paler, mouth concolorous in both sexes. Antennae somewhat longer than half body, more slender in ♂ which has the basal flagellar joint nearly twice longer than broad, in ♀ subquadrate; ♂ with scape stramineous and flagellum rufescent beneath. Thorax stout, slightly narrower than head, black with ♂ flavidous callosity before radix. Abdomen somewhat longer than head and thorax, of ♂ deplanate with the three or four basal incisures testaceous, in ♀ moderately compressed towards the anus; basal segment nearly parallel-sided and almost thrice longer than broad, finely aciculate-scabriculous, slightly impressed laterally beyond the centre, with distinct and parallel carinae extending nearly to apex; second finely aciculate-scabriculous, laterally impressed beyond the centre, subquadrate in ♀ and longer than broad in ♂; third obsoletely aciculate basally, remainder smooth; ventral plica flavidous, terebra subexserted and subreflexed. Legs normal and red, with the hind coxae sometimes basally piceous; anterior legs of ♂ paler; hind tarsi infusate. Wings slightly clouded; tegulae pale; stigma large, nearly as broad as the basal radius is long, infusate or nigrescent and in ♀ basally paler; radial nervure apically straight; nervellus angled a little below its centre; areolet broadly sessile and subtransverse, of normal size and irregularly pentagonal, or entirely wanting. Length, $3\frac{1}{2}$ —5 mm.

At once known by the large and irregularly subsemicircular or triangular stigma; and easily recognised by the arcuate genal sulcus, narrow vertex, pulvilli longer than claws, the ♀ by its subglabrous second and gradually more strongly compressed third to seventh segments, and the ♂ by its large stigma which has the basal anterior margin subarcuate.

Förster's typeless genus, *Phaenosemus* (Verh. pr. Rheinfl. 1868, p. 160) appears to have been founded upon this species.

It has occurred in Prussia and Finland, and is not infrequent in Sweden, extending to the Sarek mountains of Lapland, from July to September; it has there been bred from the pupa of *Tinea cognatella*. It was introduced as British by Marshall in 1870, but no subsequent records exist. I beat a single male from spruce fir (*Picea excelsa*) at Elvedon in Suffolk, on 4th May, 1907; the metathorax is distinctly areated, and both the brevity of the basal, radius and strong basal curve of the stigma are very remarkable; possibly the late A. J. Chitty, who was with me at the time, also took it. I have found a few specimens, sitting beneath the leaves of a lime tree in my garden at Monks' Soham in August and on 25th September; which dates point to the probability of hibernation. There is a female from St. Albans in Marshall's collection.

2. *corrugatus*, Holmgr.

Orthocentrus corrugatus, Holmgr. Sv. Ak. Handl. 1855, p. 329; Brisch. Schr. Nat. Ges. Danz. 1878, p. 108, ♂; Thoms. O. E. xxii. 2425, ♂ ♀. *O. frontalis*, Brisch. Schr. Ges. Königs. 1871, p. 103; Schr. Nat. Ges. Danz. 1878, p. 110, ♀.

Head transverse and narrow behind eyes; vertex slightly emarginate; frons smooth and black, subimpressed on either side with the orbits broadly flavidous, and the subvertical orbits concolorous, in both sexes; face normally protuberant, pubescent and, in ♂, with mouth and cheeks, entirely flavous. Antennae filiform and somewhat longer than half the body; basal flagellar joint cylindrical and nearly thrice longer than broad; of ♀ red, of ♂ with the scape flavous and flagellum subinfusate beneath; postannellus of ♀ linear. Thorax stout, hardly narrower than the head, shining and entirely black or in ♂, with pronotum pale-lined; areola elongate and narrow. Abdomen a little longer than head and thorax, black with the second and third incisures ferrugineous; first segment gradually narrowed basally, aciculate-rugulose, and subelevated before its centre, with very distinct carinae extending to apex; second somewhat longer than broad, aciculate-scabriculous, unequally impressed, with an oblique linear sulculus on either side beyond the centre; third finely alutaceous throughout and slightly impressed towards its apex; following smooth and pubescent; venter flavidous or, in ♀ like its anus, rufescent. Legs normal and red with the anterior, except their apically infusate tarsi, in ♂ paler; hind coxae black with their apices pale, and their femora often flavidous above. Wings subhyaline and stigma infusate; tegulae flavous; radial nervure apically straight and areolet triangular or pentagonal. Length, 4—5 mm.

The broadly pale frontal orbits will instantly distinguish both sexes from the remainder of the narrow-headed group of species.

It is said to be very rare in northern Sweden in August and September, and to have occurred in France, whence de Gaulle records it. For long I had seen no indigenous examples of this species, which was brought forward as British, somewhat unsatisfactorily, by the late C. W. Dale (Entom.

1881, p. 92), who says: "Last May Mrs. Hutchinson sent me, from Herefordshire, a piece of a boletus, growing on a pear tree, with some small pupae enclosed in a white silken web. In June I was successful in rearing from them a pair of *Lasiosoma* (*Sciophila*) *lutea*, Macq., and also a pair of its parasite, which Mr. Bridgman considers to be Holmgren's *Orthocentrus corrugator*." There are two males and a female from Shere in Surrey in Dr. Capron's collection, which confirm it as British.

3. *marginatus*, Holmgr.

Orthocentrus marginatus, Holmgr. Sv. Ak. Handl. 1855, p. 327; Thoms. O. E. xii. 2425, ♂ ♀.

Black, with the legs red and the hind coxae and femora sometimes infuscate or black; areolet sessile and nearly pentagonal; ♀ with basal flagellar joint triangular and a little longer than the quadrate second; ♂ with the frontal orbits below, whole face and cheeks very broadly, callosity before radix and the prosternum, with the anterior legs, stramineous. Incisures of the scabriculous three basal segments narrowly testaceous. Length, $4\frac{1}{2}$ —5 mm.

This species agrees with *O. frontator*, Zett., in having the postannellus not longer than broad and not linear, the frons apically smooth and female orbits pale-marked, but differs therefrom in the broadly sessile areolet and the ♂ immaculate pronotum; the immaculate vertical and upper frontal orbits will distinguish it from *O. corrugator*, and the strongly sculptured second segment renders the ♀ distinct from *O. stigmaticus*, to which the ♂ is remarkably similar. These males, however, will be found distinct in the slightly broader vertex of the present species, its bordered occiput, pale frontal orbits, much longer antennae (body 5 mm., antennae $4\frac{1}{2}$ mm.) which are paler above, the entirely flavous prosternum, pale-lined propleurae, entirely wanting notauli, the two basal and base of the third segment much more strongly strigose, the first not or hardly discally carinate though centrally subsulcate, hind tibiae almost white basally, first discoidal cell less acute apically, areolet broad-pentagonal and less irregularly oblique, more broadly sessile, the radial cell longer, basal radius very much longer than the regularly triangular though hardly smaller stigma.



This species is of frequent occurrence in Sweden, but our only indigenous record is by Bignell, who captured it at Bolt Head in Devon on 6th July. I have, however, seen the two males taken by Bridgman at Brundall and Earlham in Norfolk, in his collection in the Norwich Museum (cf. Trans. Norf. Nat. Soc. 1893, p. 628) and am of the opinion that they are referable to the present species, though he considered them to represent either the still unknown alternate sex of *O. longicornis*, Holmgr., or a new species. This species is certainly uncommon with us; I have twice taken the male, which strongly resembles a small *Pimpla* on the flowers of *Heracleum* in a lane at Dodnash woods in Suffolk on 8th August, 1899, and on the leaves of an aspen at Hemel Hempstead in Herts on 9th August, 1903. Wilson Saunders took a male at Reigate in Surrey, August, 1872, and there is a long series in Capron's collection from Shere, in the same county. Marshall's series of *O. marginatus* was entirely composed of *O. frontator* and *O. monilicornis*.

4. *frontator*, Zett.

Tryphon frontator, Zett. I. L. i. 398, ♀. *Orthocentrus frontator*, Holmgr. Sv. Ak. Handl. 1855, p. 326; Thoms. O. E. xxii. 2425, ♂ ♀.

Head with the vertex narrow, and the frons glabrous and nitidulous throughout; ♂ with frontal orbits entirely, the punctate face and the cheeks, flavous; ♀ with face finely and transversely aciculate-punctate and the frons broadly stramineous to but slightly above the scrobes. Antennae of ♀ with basal flagellar joint triangular and a little longer than the quadrate second, postannellus neither short nor linear. Thorax of ♂ with pronotum, prosternum, a callosity and a line before radices, flavous. Legs fulvous, with anterior of ♂ stramineous. Wings with the areolet obliquely pentagonal, subcoalescent though hardly sessile above, and but very slightly broader than high; nervellus geniculate, though not intercepted. Length, 4—5 mm.

The hind coxae are sometimes black with the femora above, tarsi and apices of their tibiae, occasionally infuscate; the ♀ rarely has the areolet externally incomplete.

This species is at once known from *O. stigmaticus* by the normal stigma and sculptured second segment, from *O. corrugatus* by the immaculate vertex, and from *O. monilicornis* by the pale frontal markings, which are confined to the orbits and do not extend across the disc as in *O. sannio*.

O. frontator has not before been recorded from Britain, and my knowledge of it is derived from several examples of both sexes, captured some twenty years ago in the neighbourhood of Shere in Surrey by the late Dr. Edward Capron, in whose collection they were (like every other species of *Orthocentrus*, except Bridgman's MS. *O. unifasciatus*) unnamed. It is a northern species, first found in Lapland and recently captured by Roman in the Sarek Mountains of Sweden (Nat. Unt. Sarek, iv. 352), though extending as far south as France. As, doubtless, in most collections, the males of this species were mixed in Marshall's with those of *O. monilicornis* and *O. marginatus*; they are from Cornworthy in Devon. Lyle has beaten a female in the New Forest from *Ulex* on 26th October, which points to hibernation.

5. *sannio*, Holmgr.

Orthocentrus Sannio, Holmgr. Sv. Ak. Handl. 1855, p. 331; Thoms. O. E. xxii. 2426, ♂ ♀; cf. Brisch. Schr. Ges. König. 1871, p. 102 et Schr. Nat. Ges. Danz. 1878, p. 109, ♂. *O. unifasciatus*, Bridg. MS., ♂.

Black. Head of ♂ with face, cheeks very broadly and frons entirely, flavous. Antennae of ♀ with the two basal flagellar joints subtransverse. Thorax of ♂ with the prothorax and mesosternum entirely flavous. Abdomen with apex of the second and basal half of the third segments in ♂ red. Legs fulvous with the anterior of ♂ flavous and its hind coxae subinfuscate basally above. Wings with the areolet pentagonal, subpetiolate and but very slightly broader than high; nervellus geniculate at its lower fourth, but hardly intercepted. Length, $3\frac{1}{2}$ —5 mm.

This species is similar to *O. marginatus* and *O. frontator* in its capital conformation and glabrous frons, but the female has the basal flagellar joints shorter and the ♂ is abundantly distinct in the unique colouration of its frons and mesosternum.

O. sannio is new to our fauna, though five males have stood in Dr. Capron's collection, under Bridgman's manuscript name, some twenty years and these were doubtless captured by the former in the neighbourhood of Shere, in Surrey. It is not infrequent in Sweden, occurs in Prussia, and de Gaulle says (Cat. Hym. 55) that in France it has been bred from a species of the Tenthredinid genus *Nematus*.

6. *monilicornis*, Thoms.

Orthocentrus monilicornis, Holmgr. Sv. Ak. Handl. 1855, p. 332, ♂ ♀ (?); Thoms. O. E. xxii. 2426, ♀.

Black. Head with the vertex narrow; frons immaculate and very finely punctate below the ocelli; face of ♀ finely and transversely aciculate-punctate, of ♂ punctate and somewhat dull; ♂ with face to shortly above scrobes on either side, and the cheeks, flavous. Antennae of ♀ with the basal flagellar joint subtransverse. Thorax of ♂ with prosternum and large callosities before radices flavous. Legs rufescent with the hind ones often partly subinfusate, and the anterior of ♂ stramineous. Wings with the areolet somewhat regularly pentagonal, not broader than high and elongately sessile; nervellus geniculate at its lower fourth, but not intercepted. Length, 3—4½ mm. ♀ ♂.

It differs from all the preceding species in its black frons which is subconvex and very finely punctate (not glabrous) below the ocelli, in the subtransverse basal ♀ flagellar joint and in the hind pulvilli being as long again as their somewhat slender claws.

Holmgren says of his species "fronte ante laevisissima," but I do not consider it improbable that it is synonymous with that of Thomson, which is only punctate immediately below the ocelli and not at its apex; nor am I at all satisfied that my ♂, which has the prosternum broadly pale, is that of the former author, but in both cases the association is purely arbitrary.

Mr. Albert Piffard used to take this species not uncommonly at Felden in Herts, though he had none named, Tuck found a female at Tostock in Suffolk, during July, 1900, and there is also a male in Dr. Capron's collection from Shere in Surrey. It has not before been noticed in Britain, though common in Lapland during August and September; and seven specimens in Marshall's collection, mixed with *O. frontator*, are from Botusfleming in Cornwall and Cornworthy in Devon. It occurs beneath lime leaves in my garden at Monks' Soham in July and August, and I have seen it investigating rose leaves at the end of the latter month.

7. *attenuatus*, Holmgr.

Orthocentrus attenuatus, Holmgr. Sv. Ak. Handl. 1855, p. 330; Thoms. O. E. xxii, 2428, ♀.

Black. Head not very narrow vertically, with face granulated punctate and below the scrobes transversely stramineous; mandibles and palpi white. Antennae with the postannellus transverse and subtriangular, and the flagellar joints ferrugineous beneath. Abdomen with the basal segment not bicarinate, the second very finely alutaceo-strigose, the third not transverse and the following gradually more strongly compressed to

anus. Legs fulvous. Wings with the areolet twice broader than high; nervellus geniculate, and intercepted at its lower third. Length, 5 mm.

Thomson says that this species is similar to *O. fulvipes* in the structure of the antennae, legs and alar neuration, but that it differs in the granulate punctate face, shorter cheeks, in having the basal segment thrice longer than apically broad and not sulcate, in the alutaceously strigose second and basally hardly alutaceous third. Moreover, this and the next species differ from the remainder of the genus in Britain in their distinctly granulate face which is confined above by an entire stramineous line, the strongly transverse areolet and elongate abdominal segments.

Very rare in southern Lapland in August (Holmgren and Roman); Germany (Thomson); and France (Gaulle). It is probably not uncommon with us, though not hitherto recorded from Britain, since I have several times taken it on the windows of Monks' Soham House, Suffolk, and the Rev. T. A. Marshall has given it me, probably captured at Botusfleming in Cornwall.

8. *petiolaris*, Thoms.

Orthocentrus petiolaris, Thoms. O. E. xxii 2428, ♀.

Black; ♂ with face, cheeks, prosternum, a triangular mark before radices and the antennae basally beneath, flavescent. Abdomen with the basal segment not sulcate and, with the second, coriaceous; second and third with their apical margins substramineous. Legs fulvous, of ♂ paler with its hind coxae internally nigrescent above. Length, 5 mm. ♂ ♀.

This Swedish ♀ was described as distinct from the last species, with which it coincides in the capital colouration, facial puncturation and the structure of the legs and of the alar nervures, solely on the strength of its coriaceous two basal segments, apically subdilated sixth, the almost transverse third and less compressed anus. I consider its stability doubtful; but here place a ♂, which agrees better in its abdominal conformation than with that of the last species.

No one has recognised the ♀ since first described, and I have seen but a single ♂, captured by Mr. Stanley Edwards at Lynton, in Devon, in 1890 and now in my collection.

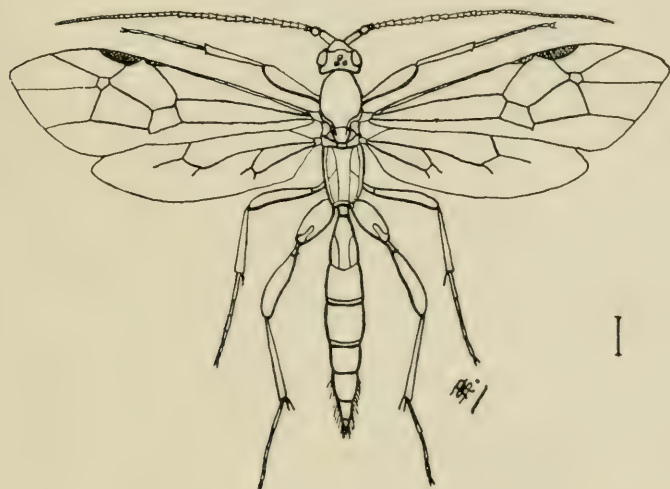
9. *fulvipes*, Grav.

Orthocentrus anomalus, Gr. I. E. iii, 360, ♂ (part.); Holmgr. Sv. Ak. Handl. 1855, p. 351, excl. ♀; cf. Westw. Mod. Class. ii, Synop. 59. *O. fulvipes*, Gr. I. E. iii, 363, ♀ (♂ sic); Holmgr. Sv. Ak. Handl. 1855, p. 334; Thoms. O. E. xxii, 2429, ♂ ♀.

Head somewhat transverse, normally buccate; vertex not very broad, but deeply emarginate; frons deplanate, apically smooth and basally finely punctate; face normally protuberant, punctate and pubescent, of ♂ entirely stramineous and in ♀ piceous with its apex and the basal margin ferrugineous; ♂ also with frontal orbits shortly, cheeks broadly and the mouth, stramineous; ♀ mouth rufescent and genal sulcus distinct. Antennae of ♂ filiform and somewhat longer than half the body, with scape flavidous and flagellum testaceous beneath, its basal flagellar joint twice longer than broad; of ♀ shorter and stouter with flagellum rufescent beneath and its basal joint transverse. Thorax narrower than head, subcylindrical; ♂ prosternum, prothoracic margin and anteradical callosities

flavidous; pleurae smooth, metanotum with three elongate areae. Abdomen subdeplanate, and but slightly compressed in ♀ towards anus; basal segment subparallel-sided, aciculate-rugulose, impressed on either side beyond centre, with slender carinae extending to apex; second aciculate-rugulose with an impressed transverse line on either side beyond centre, and piceous with the apex dull testaceous; third basally aciculate or alutaceous, impressed like and concolorous with the second; remainder smooth, pubescent and immaculate; venter stramineous, terebra not exerted. Legs of ♂ testaceous with the anterior coxae and trochanters stramineous, and hind coxae and femora sometimes more or less infusate above; of ♀ stouter and red with hind coxae often infusate above. Wings slightly clouded; tegulae pale, stigma always infusate; radial nervure apically straight and basally curved; areolet pentagonal, somewhat small and strongly constricted in front. Length, 4—5 mm.

It differs from *O. protuberans*, Holmgr., in having the face less prominent, the internal radial nervure longer, areolet smaller, the ♂ capital



colouration and ♀ distinct genal sulcus; it is often double the size of *O. monilicornis*, Holmgr., with the head more buccate, antennae stouter, was basal flagellar joint shorter, the two basal segments rugulose with more distinct carinae, areolet larger and legs paler. It may be known from *O. Radialis*, Thoms. (*anomalus*, Gr. part), by its infusate stigma and basally curved radius; from *O. strigator* by the hind pulvilli exceeding the claws in length, and entirely pale venter; and from both *O. attenuatus*, Holmgr. and *O. petiolaris*, Thoms., by the face being simply and not granulosely punctate.

It is uncommon in Sweden (Holmgren), Germany (Grav.) and France (Gaulle, who says it preys upon the Longicorn beetles *Saperda scalaris* and a species of *Leiodus*). Hope took two males at Netley in Shropshire of the form *anomalus*, Gravenhorst. It is common in Britain during the summer; Capron took many at Shere in Surrey, Edwards has found it at Lynton in Devon, Marshall at Govilon in Wales, Cornworthy and Botusfleming in Cornwall; and it has occurred to me during June in my garden

at Monks' Soham and by sweeping in Tuddenham Fen, Suffolk. Marshall introduced *Orthocentrus spurius*, Grav., as British in 1870, on the strength of a ♀ of the present species, which he had captured at Rannoch and is still in his collection (in Mus. Brit.); its author knew but a single ♀, from Warmbrunn in Silesia, and no one has since recognised it; possibly it is synonymous with *O. fulvipes*, though Thomson thought it more like *O. protuberans* (O.E. 2430). Haliday's MS., in Dublin Museum, indicates it as taken commonly by himself in Ireland.

10. *radialis*, Thoms.

Orthocentrus radialis, Thoms. O.E. xxii, 2430, ♂ ♀. *O. anomalus*, Gr. I. E. iii, 360, ♂ (part.).

Black. Head of ♂ with the cheeks, face and mouth stramineous. Antennae of ♀ ferrugineous throughout. Legs fulvous. Wings with the stigma pale and the radial nervure basally straight. Length, 3—5 mm.

Almost exactly like the last species, especially in respect of the pedal and prothoracic colouration; but differing therefrom in its pale stigma, basally straight radius, the ferrugineous ♀ antennae, and in the ♂ having the frons entirely black and the cheeks less broadly stramineous.

I have had considerable difficulty in distinguishing the representatives of this species from those of the last; but I fancy the above characteristics are sufficiently constant to warrant it standing. It would appear to be commoner with us than *O. fulvipes*, since Piffard has taken it freely at Felden in Herts; Marshall a long series at Cornworthy in Devon; Beaumont at Enniscorthy in September; Yerbury at Golspie in Sutherland in August; Bowdler at Blackburn and Capron at Shere in Surrey. I took a ♀ in my father's garden at Ryde, in the Isle of Wight, during the first half of October, 1901. It is probably much mixed with the preceeding on the Continent, whence it is only known from Sweden.

11. *protuberans*, Holmgr.

Orthocentrus protuberans, Holmgr. Sv. Ak. Handl. 1855, p. 333; Thoms. O. E. xxii, 2429, ♂ ♀; cf. Roman, Nat. Unt. Sarek. iv. 352. *O. insularis*, Ashm. Journ. Linn. Soc. Zool. 1894, p. 142, ♂.

Nitidulous, punctate and nigrescent. Head not vertically narrow; frons somewhat smooth anteriorly and a little impressed, basally punctulate; face strongly protuberant, punctulate and in ♀ piceous; ♂ with mouth, clypeus and face, ♀ with mouth and facial margin below antennae, pale. Antennae rather longer than half body, of ♂ somewhat slender and in ♀ stout with basal flagellar joint very short and transverse; basally pale beneath in both sexes. Thorax narrower than head, subcylindrical and black with the pleurae very smooth and three elongate metanotal areae. Abdomen a little longer than head and thorax; basal segment subparallel-sided, hardly elevated basally and a little deplanate apically, finely and aciculate rugulose with carinae extending nearly to its apex; second subquadrate or in ♂ longer than broad, subrugulose and becoming both basally and laterally aciculate, impressed on either side beyond the centre, ferrugineous in ♀ or black with the apical margin pale in ♂; third basally aciculate and apically nearly smooth, entirely black or apically subrufescent; the following shining and pubescent, apically paler; ♂ with the second incisure and ♀ with the three basal incisures pale; venter of

♂ and the ventral plica of ♀ flavous. Legs red; anterior of ♂ nearly entirely, with the hind trochanters and base of tibiae, flavous and the hind tarsi subinfusate; ♀ with coxae, femora and apices of hind tarsi more or less piceous; hind pulvilli longer than the stout claws. Wings subhyaline with the stigma infusate and tegulae flavous; radial nervure externally straight; areolet large, pentagonal and sessile; nervellus intercepted below its centre. Length, 4—5 mm.

Thomson distinguishes this species from the two following by the lack of all ♀ genal sulci and by the ♂ having the mouth, face, callosity before radices and margin of the prosternum pale, the basal abscissa of the radial nervure straight, longer than the second and hardly a third the length of the third.

Both sexes sometimes have the legs red with the hind coxae partly black, or the ♀ legs may be entirely red or red with the hind coxae nearly entirely black and their femora concolorously lined; the second to third or fourth incisures are sometimes pale and the tarsi often infusate.

It is common from July to September in Sweden (Holmgren); not infrequent in subarctic Europe (Roman); Germany (Brischke), Austria (Strobl), and France (Gaulle); it also occurs in the northern latitudes of Asia and America. It has not hitherto been noticed in Britain and I can instance but a single ♂, which I beat from *Pinus sylvestris*—along with *O. stigmaticus*—at Elvedon in Suffolk on 4th May, 1907, and a ♀ taken by Lyle in the New Forest at the blossom of *Euphorbia amygdaloides* as early as 24th April.

PICROSTIGEUS, Thomson.

Thoms. Opusc. Ent. xxii (1898), 2430.

Head with vertex not narrow; face very finely punctate and not short; genal sulcus impressed; clypeus apically subtruncate and not concealing mandibles. Antennae of ♀ with postannellus not transverse. Abdomen of ♀ with the second segment large and transversely impressed; terebra elongately exerted. Legs not stout nor pulvilli longer than claws. Wings with the anal nervure emitted from centre of brachial cell and radius from centre of stigma; areolet usually entire and shortly pentagonal; hind wings with cubital nervure distinct to base, the nervellus vertical and not geniculate.

The species of this genus are easily known in the female sex by the strongly exerted terebra, but the males are very liable to be confused with those of the next genus.

Thomson here includes three species and I know of no additions; but these are so closely related *inter se* that I entertain some doubt respecting their value, and prefer to consider as British only that which has for so long stood in our lists.

1. *anomalus*, Holmgr.

Orthocentrus varius, Holmgr. Sv. Ak. Handl. 1855, p. 335, ♂ (?). *O. anomalus*, Holmgr. lib. cit. p. 351, excl. ♂ (*nec* Grav.). *Picrostigeus recticauda*, Thoms. O. E. xxii. 2431, ♂ ♀.

Head not narrowed posteriorly; vertex normally emarginate; frons smooth and subimpressed in front, convex and finely punctulate around the ocelli; face protuberant and hardly shining; mouth and basal margin

of face testaceous, ♂ with face entirely stramineous. Antennae longer than half the body and basally paler beneath; basal flagellar joint cylindrical in both sexes. Thorax narrower than head, shining, black or brunneous with metanotal and petiolar areae usually distinct and complete. Abdomen a little longer than head and thorax, of ♀ somewhat compressed apically; basal segment alutaceous or subscabriculous but not aciculate, hardly elevated basally, depressed on either side beyond its centre with very obsolete discal carinae; second to fifth segments shining, smooth and strongly transverse; sixth and seventh far exserted; terebra straight and as long as or slightly longer than the abdomen. Legs normal and testaceous or red; the anterior of ♂ stramineous; hind coxae always piceous and apically paler; hind tarsi apically, or sometimes legs mainly, infusate. Wings subhyaline, stigma and nervures pale piceous; radial nervure externally straight; areolet pentagonal and always entire; radial cell distinctly elongate; nervellus not angled. Length, 3—4 mm.

The whole insect is usually brunneous, though sometimes black and at others ferrugineous.

Holmgren's ♂ appears to agree with his ♀ in its abdominal structure to a remarkable extent. This species is said by Thomson to be the largest of the three he assigns to this genus and to be known from the remainder by its less slender legs and antennae, and apically longer radial nervure; the ♂ sometimes has the anterior legs stramineous and their femora rarely black-lined beneath, the hind coxae are always dark, sometimes with their tarsi and tibial apices concolorous.

Frequent in Sweden at the end of August (Holmgren); common in Ireland (Haliday MS. in Dublin Museum). Females in my collection were captured at Whitby in Yorkshire on 24th August, 1897, by Alfred Beaumont; Felden in Herts by Albert Piffard; and Egloskerry in Devon by on 23rd July, 1882, by Bignell. Probably Bridgman's records from Eaton and Earham, near Norwich, and Crabtree Fort near Plymouth at the end of August, refer to the present species; there is a series in Marshall's collection from Govilon in Monmouth, Botusfleming in Devon, Lavingham in Yorks, Cornworthy in Devon, and St. Albans; and I have seen a female beaten at Brockenhurst on 26th Feb., 1911, by Lyle from spruce fir.

STENOMACRUS, Thomson.

Thoms. O. E. xxii (1898). 2433.

Head with the vertex not narrow; clypeus apically truncate and not covering the mandibles. Abdomen with the terebra rarely exserted, and then slender and curved. Wings with the radial nervure often emitted before centre of stigma; areolet frequently wanting; anal nervure emitted from centre or above centre of brachial cell; hind wings with the cubital nervure basally wanting and the nervellus vertical (not oblique), opposite or subpostfural, and neither geniculate nor intercepted.

This genus is recognised by the position of the nervellus and basally obsolete cubital nervure of the hind wing; it comprises some of the smallest and most puzzling of all Ichneumonidae.

These were almost indeterminable till Thomson published his revision of them in 1898, with the result that nearly the whole of our records before that time are worthless. He divided the genus into five main sections, which I have not very exactly followed in the following table, since

his distinctions, as usual, are by no means obvious till we possess a large number of specimens for comparison. We appear to possess none of the members of his first section—excepting the fabulous *Neurateles papyraceous*—and it appears but poorly distinguished (in words) from his fifth, since the distinctions seem to lie in the sculptured apex of the second segment, the sub-parallel-sided and thrice longer than broad basal segment, and the cultriform ♀ abdomen.

I am inclined to place more reliance than my predecessors upon the presence or absence of areolet in this genus. The outer nervure is always distinctly visible when present and examined in a good light, and I have met with none among my numerous specimens, concerning which I have felt compelled to entertain the least doubt in this respect. The feature cannot, however, be determined when the wing is gummed on card; but the wings of specimens carded with gum tragacanth can almost invariably be raised intact by passing a fine needle beneath them from the thorax outwards.

Probably we have more species than those with which I am acquainted in the following table.

Table of Species.

- | | | | |
|-------|-----|---|-----------------------|
| (14). | 1. | Areolet of the wing more or less distinctly present. | |
| (5). | 2. | Basal segment subdeplanate, neither sulcate nor impressed [Sect. iii, Thoms.]. | |
| (4). | 3. | Vertical orbits broadly pale; basal nervure postfurcal | 1. FLAVICEPS, Grav. |
| (3). | 4. | Vertical orbits immaculate basal nervure continuous | 2. CAUDATUS, Holmgr. |
| (2). | 5. | Basal segment convex, always impressed and discally sulcate [Sect. iv, Thoms.]. | |
| (7). | 6. | Hind tibiae basally whitish; 4 basal incisures stramineous | 3. INCISUS, Grav. |
| (6). | 7. | Hind tibiae not basally whitish; 4th incisure not pale. | |
| (9). | 8. | Radius emitted from basal third of stigma; terebra exerted | 4. CURVICAUDATUS, Br. |
| (8). | 9. | Radius emitted from centre of stigma; terebra not exerted. | |
| (13). | 10. | Stigma pale infusate, as dark as the nervures. | |
| (12). | 11. | Areolet sessile; radius straight; antennae black | 5. CONCINNUS, Holmgr. |
| (11). | 12. | Areolet subpetiolate; radius curved; antennae testaceous | 6. DELETUS, Thoms. |
| (10). | 13. | Stigma pale stramineous, much paler than the nervures | 7. LARICIS, Hal. |
| (1). | 14. | Areolet entirely wanting. | |
| (20). | 15. | Space between submarginal and recurrent nervures shorter than submarginal [Sect. ii, Thoms.]. | |
| (17). | 16. | Abdomen pubescent; radial nervure apically straight | 8. RIDIBUNDUS, Grav. |
| (16). | 17. | Abdomen not pubescent; radius distinctly curved apically. | |

- (19). 18. Radius emitted beyond centre of the flavous stigma 9. VENTRALIS, *Holmgr.*
 (18). 19. Radius emitted from centre of the infusate stigma 10. AGILIS, *Holmgr.*
 (15). 20. Space between submarginal and recurrent nervures longer than submarginal [Sect. v, Thoms.].
 (30). 21. Radial nervure emitted from centre of stigma.
 (23). 22. Stigma infusate, broad, and convex below 11. CONFINIS, *Holmgr.*
 (22). 23. Stigma luteous, narrow, and straight below.
 (25). 24. Radial nervure externally straight; size larger 12. INTERMEDIUS, *Holm.*
 (24). 25. Radial nervure externally curved; size smaller.
 (27). 26. Head transverse; terebra not exerted 13. COGNATUS, *Holmgr.*
 (26). 27. Head cubical; terebra sometimes elongately exerted.
 (29). 28. Cheeks of ♂ black; terebra of ♀ elongately exerted 14. EXERENS, *Thoms.*
 (28). 29. Cheeks of ♂ flavous; terebra of ♀ not exerted 15. AFFINIS, *Zett.*
 (21). 30. Radial nervure emitted from distinctly before centre of stigma.
 (34). 31. Head distinctly transverse; hind femora not entirely black.
 (33). 32. Body and legs very distinctly slender 16. PUSILLUS, *Zett.*
 (32). 33. Body and legs, especially the hind or posterior, stouter 17. BINOTATUS, *Holmgr.*
 (31). 34. Head cubical; hind femora usually entirely black.
 (36). 35. Length 2—3 mm.; face of ♂ black 18. CUBICEPS, *Thoms.*
 (35). 36. Length 4—5 mm.; face of ♂ flavous 19. SILVATICUS, *Holmgr.*

1. *flaviceps*, *Grav.*

Orthocentrus flaviceps, Gr. I. E. iii. 364, ♂ (*nee* Holmgr.). *O. concinnus*, Holmgr. Sv. Ak. Handl. 1855, p. 336, excl. ♀. *O. caudatus*, Holmgr. l. c. p. 351, var. indiv. Boh., ♀. *Stenomacrus flaviceps*, Thoms. O. E. xxii. 2440, ♂ ♀.

Head subglobose, of ♀ with the face below scrobes and the vertical orbits broadly stramineous, of ♂ with mouth, cheeks, face and both frontal and vertical orbits broadly flavous. Antennae filiform, shorter than body and infusate with the scape flavous, and the following joints in both sexes ochraceous, beneath. Thorax subcylindrical and black with the ♂ propleuræ and callosities beneath radices flavous. Abdomen linear-cylindrical, narrower and a little longer than head and thorax; basal segment evenly scabriculous and twice longer than broad; second segment of ♀ nearly entirely scabriculous; ♂ with incisures of second and third testaceous. Legs normal; the anterior fulvous with the coxæ and trochanters of ♂ stramineous; hind ones darker with the coxæ basally infusate above, and trochanters sometimes flavous; tarsi, tibial apices and sides of femora sometimes infusate. Wings hyaline with the stigma and radius stramineous, radix and tegulæ of ♂ flavous; areolet obliquely pentagonal with its nervures fine. Length, 2 $\frac{3}{4}$ mm.

Very like *S. caudatus*, but the ♀ has the face above and broad vertical dots pale, with nearly the whole of the second segment finely and scabriculously punctate; and the male has the whole face, cheeks, frontal and vertical orbits, the propleurae, radical callosities and anterior coxae stramineous, with the hind coxae basally nigrescent.

Gravenhorst tells us that Hope took it about Netley in Shropshire, but there are no subsequent records. It is certainly rare with us and I have only seen two beautiful females in Dr. Edward Capron's Surrey collection; Haliday, in his MS. diary, now in the Dublin Museum, says he found it commonly in Ireland.

2. *caudatus*, Holmgr.

Orthocentrus caudatus, Holmgr. Sv. Ak. Handl. 1855, p. 350, excl. ♂ et var. *Stenomacrus caudatus*, Thoms. O. E. xxii. 2440, ♂ ♀.

A black species with the legs pale; ♂ mouth, face and anterior legs stramineous. Length, $2\frac{1}{2}$ — $2\frac{3}{4}$ mm.

This and the preceding species are placed in a group apart from the remainder of the genus by Thomson, who says they may be known by distinct areolet, the petiole neither elevated nor bicarinate, the strongly developed pulvilli and the ♀ by the elongate abdomen. The head is somewhat narrowed behind the eyes, the vertex very broad, antennae in ♀ spirally curled and not apically attenuate with postannellus cylindrical, stigma pale and emitting radius from its centre, radial cell not elongate and anal nervure emitted from centre of brachial cell; the ♀ abdomen is strongly elongate and apically compressed with the terebra not extending beyond its apex, hind femora and tibiae very stout with the onychii and pulvilli strongly developed, the venter pale and the legs flavescent with the hind coxae sometimes darker.

The peculiarly deplanate and broad basal segment, which is evenly rugulose and neither impressed nor bicarinate, will distinguish this female from the rest of the genus; the ♂ is similar to that of *S. concinnus*, in its oblique and postfurcal basal nervure, the black hind coxae and their often infusate femora, but differs in having the anterior legs stramineous and the cheeks apically flavous; it is also similar to the ♂ of *S. laricis*, but is distinctly smaller and more slender with the pronotum black and vertical orbits immaculate.

Capron found both sexes in Surrey and Piffard took a ♂ in Herts; I swept a ♀ at the Ventnor landslip, Isle of Wight, at the end of June, 1907, and a couple of males from long grass in a dry ditch at Mildenhall, in Suffolk, towards the end of the following September.

3. *incisus*, Grav.

Orthocentrus incisus, Gr. I. E. iii. 361, ♂.

Head black with the mouth, cheeks and the strongly convex face whitish. Antennae slender, filiform, a little shorter than the body and infusate, becoming stramineous basally. Thorax gibbulous, with the prothorax and sternum fulvous. Abdomen subsessile, a little longer and narrower than the head and thorax, and somewhat dilated gradually towards the anus; basal segment dull and subsulate, slightly constricted basally, nearly thrice longer than broad with the margin, like those of

the three following segments, stramineous; three basal segments obliquely impressed laterally, and the remainder glabrous. Legs fulvous with the anterior coxae and trochanters, and the hind tibiae basally, whitish. Wings ample and hyaline; radius and stigma dull stramineous, radix and tegulae whitish; areolet irregularly pentagonal and obliquely transverse. Length, $3\frac{3}{4}$ mm.

This species is given as British by Marshall, doubtless on the strength of Desvignes' record (Cat. 91); but the five specimens placed by Desvignes under this name in his collection are a ♂ of *Orthocentrus fulvipes*, a couple of ♀ *Stenomacrus laricis* and two other ♀ of the same genus with no areolet! Gravenhorst knew but a single ♂, from Warmbrunn in Silesia, and no one has since recognised the species, which Thomson (O. E. 2430) thought possibly a form of *O. attenuatus*, Holmgr. Our claim to it as British is entirely imaginary, though Haliday's MS. records it as taken by himself commonly in Ireland.

4. *curvicaudatus*, Brisch.

Orthocentrus curvicaudatus, Brisch. Schr. Ges. König. 1871, p. 103; Schr. Nat. Ges. Danz. 1878, p. 111, ♀. *Stenomacrus brevicaudatus* (sic), Thoms. O. E. xxii. 2445, ♂ ♀.

A black species, with the legs partly pale. Head of ♀ not posteriorly constricted; ♂ face centrally broadly pale. Flagellum filiform with the basal joint short, triangular and in ♀ a little shorter than the quadrate second, or in ♂ slightly longer. Abdomen glabrous, nitidulous and not strongly compressed, with the second segment smooth; venter basally pale; the slightly curved terebra a little shorter than the broad basal segment and extending a little beyond the subcompressed anus. Legs somewhat stout; the femora black with their apices and trochanters pale; ♂ with tarsi and tibiae infusate. Wings with the radial nervure apically nearly straight and basally emitted from basal third of stigma; anal nervure emitted from centre of brachial cell; areolet irregular, emitting recurrent nervure from its apical angle. Length, $3-3\frac{1}{2}$ mm.

At once known by the basal position of the radial nervure and its dark legs; the areolet is said to be sometimes obsolete or distinctly wanting, but it is clear in my ♂ ♂.

Brischke described it from Prussia, and it is also found in Sweden. I find I possess three males, taken at Bickleigh in Devon early in June, and by sweeping march herbage at Brandon and Tuddenham Fen, in Suffolk, at the end of June and of September.

5. *concinus*, Holmgr.

Orthocentrus concinns, Holmgr. Sv. Ak. Handl. 1855, p. 336, excl. ♂; Brisch. Schr. Ges. König. 1871, p. 102, excl. ♂; Schr. Nat. Ges. Danz. 1878, p. 109, ♀. *Stenomacrus concinns*, Thoms. O. E. xxii. 2441, ♂ ♀.

A small, shining, black species. Head of ♀ with the upper margin of face pale to the eyes, of ♂ with the face and mouth entirely pale but the cheeks black. Antennae black, becoming pale beneath towards the base; flagellum filiform and postannellus cylindrical. Mesonotum glabrous; ♂ pronotum black. Abdomen apically compressed and basally rugose; terebra not exerted beyond anus. Legs testaceous and somewhat stout

with the hind coxae nearly entirely black, and sometimes the hind or posterior femora infuscate above; claw-joints and pulvilli large, with the latter longer than the claws. Wings with the areolet small and pentagonal; stigma pale fuscous, not stramineous; radial cell not elongate, with apex of radial nervure nearly straight; anal nervure emitted from centre of brachial cell. Length, $2\frac{1}{2}$ —3 mm.

Easily recognised by its dark though not nigrescent stigma, which emits the radius from its centre, the sessile areolet and filiform antennae, which are nigrescent above.

This species would appear somewhat uncommon with us; Marshall has given me a female from Govilon in Monmouth and there is another in Capron's Surrey collection; I took one sitting beneath a lime leaf in my Monks' Soham garden at the end of May, 1908, and swept a single male from marsh herbage in Ranworth Broad in the middle of June, 1901.

6. *deletus*, Thoms.

Stenomacrus deletus, Thoms. O. E. xxii. 2442, ♀.

Black with the legs pale, the hind coxae black above, radial nervure apically curved, metathorax with no areae and the face pale below the scrobes. Length, $2\frac{3}{4}$ mm.

Thomson says that the ♀, which he thus shortly describes, is very similar to the last species, but has the antennae apically subattenuate, the face only centrally pale below the antennae, no metathoracic areae, the radius obviously sinuate, the second segment quite smooth and the thyridii pale.

I have not seen the female but possess two males, which must be placed under this or a new name; it is always well to avoid the erection of new species when practicable and I consequently regard them as the alternate sex of the present, especially since they differ only in having the whole face, mouth, cheeks, underside of antennae and prosternum pale stramineous, with the hind coxae and antennae but subinfuscate above; their size is two-and-a-half mm. and the abdomen is strongly deplanate towards its apex.

It is only known from Sweden and I took my males sitting on the under side of lime leaves in my garden at Monks' Soham, Suffolk, about 6 p.m. on 24th May, 1908, during thundery but somewhat breezy weather.

7. *laricis*, Hal.

Orthocentrus laricis, Hal. Ann. Nat. Hist. 1839, p. 117, ♀. *O. flaviceps*, Holmgr. Sv. Ak. Handl. 1855, p. 335; Brisch. Schr. Ges. König. 1871, p. 102; Schr. Nat. Ges. Danz. 1878, p. 109, ♂ (*nec Grav.*). *Stenomacrus fortipes*, Thoms. O. E. xxii. 2442, ♂ ♀.

Head of ♂ flavous with only the occiput, vertex and an ocellar mark sometimes including centre of frons, black; of ♀ piceous with a facial mark below the scrobes and a central dot at the often rufescent frontal orbits flavous. Antennae ferrugineous, of ♀ apically darker, of ♂ entirely stramineous beneath; basal flagellar joint cylindrical. Thorax black, with complete metanotal areae, of ♂ with the prothorax entirely stramineous. Abdomen rather longer than head and thorax, black or piceous with the central incisures and gastrocoeli testaceous; basal segment entirely and second to beyond its centre aciculate-scabriculous, the former

laterally impressed beyond the centre and at least in ♂ distinctly bicarinate; anus of ♀ distinctly compressed, with terebra not exerted. Legs stout and fulvous, of ♂ long with the anterior entirely stramineous and hind ones flavescent; claws and pulvilli not large; calcaria curved. Wings hyaline with radial nervure apically straight; areolet distinct and subpentagonal with the outer nervure pellucid; radix and tegulae of ♂ flavous, of ♀ piceous; stigma in both sexes extremely pale stramineous and much paler than the nervures; anal nervure emitted from centre of brachial cell. Length, 3—4 mm.

At once known by the peculiarly pale stigma, which resembles only that of *S. flaviceps* and *S. caudatus*, the profuse pale markings of the ♂, which differs from that of *S. caudatus* in its entirely pale pronotum and stouter outline, and the conspicuously binotated ♀ frontal orbits.

This is certainly one of the most abundant species in Britain, though the synonymy is too involved to determine its Continental range; I possess seventy specimens. The male appears to be restricted in its duration of perfect existence to a short period, since it has occurred to me abundantly in Tuddenham Fen, at Foxhall, on *Pinus sylvestris* in Bentley Woods, Bramford and on Pine at Brandon; I have repeatedly taken it on fir trees near Elvedon in Suffolk and on 14th June, 1902, it was excessively common there among bracken, sitting on the trunks and flying to the branches of these trees, from which I beat both sexes on 9th of the following June. Though undoubtedly attached to *Coniferae*, among which the type was commonly captured by Haliday at Holywood, it also occurs on oak and sallow, whence I took numerous examples at Mousehold Heath, near Norwich on 9th June, 1901, and Bridgman also found it there on ling in July; near Ipswich it occurs on birch, at Barton Mills on poplar and at Southwold on reeds. The male is very rare in May and I have not seen it later than 22nd June; but the female has a much longer span, my dates ranging from 3rd July to 28th September at Tuddenham on birch, Foxhall on the flowers of *Spiraea ulmaria* and at Oxshott in Surrey. Piffard has found it at Felden in Herts, Butler at Abinger Hammer, Marshall at Darenth Wood, Yerbury at Oxshott early in June, and Wilson Saunders at Reigate in Surrey, Tuck at Finborough in Suffolk and Beaumont at Chobham, and Blackheath in Kent. No host has yet been assigned to it.

8. *ridibundus*, Grav.

Orthocentrus ridibundus, Gr. I. E. iii. 366, ♂; Holmgr. Sv. Ak. Handl. 1855, p. 337, ♂ ♀. *Stenomacrus ridibundus*, Thoms. O. E. xxii, 2437, ♂ ♀.

A punctulate, somewhat shining and large species. Head transverse and not buccate; frons a little impressed in front; face punctulate and somewhat protuberant; mouth and in ♂ whole, or in ♀ part, of face flavous. Antennae filiform, a little shorter than the body, with the three basal joints luteous or in ♂ paler beneath; basal flagellar joint cylindrical and as long as the following. Thorax stout, gibbulous and discally punctate, ♂ often with a prothoracic mark ferrugineous; metathoracic areae obsolete, areola wanting though basally indicated, petiolar area distinct. Abdomen sublinear and subsessile, as long as the head and thorax and in ♂ narrower than the latter; first segment deeply sulcate and basally subconstricted, twice longer than broad in ♂, in ♀ shorter; second transversely impressed, of ♂ quadrate and of ♀ transverse; two basal segments

coarsely aciculate, third smooth and badius; venter and ♀ anus fulvescent; terebra slightly reflexed. Legs normal and entirely fulvous with only the tarsi apically infusate. Wings ample and hyaline with the radius infusate; stigma, radix and tegulae stramineous; areolet wanting, and second recurrent emitted from the cubital nervure nearer the submarginal than the length of the latter. Length, $3\frac{3}{4}$ — $4\frac{1}{2}$ mm.

Amongst the largest of the species with no areolet and larger than the following two, with which alone it shares the approximate recurrent nervures; and known by its pubescent abdomen, ample wings, and the emission of the apically nearly straight radial nervure from almost before the centre of the pale stigma.

It is said to be not very common in Lapland and Sweden. Marshall introduced it as British in his 1870 Catalogus on the strength of a ♂ of the maximum size, which he captured at Govilon in Monmouth, and I have examined in the British Museum; it is certainly rare with us since I, too, have found but a single ♂, by sweeping in a marsh at Henstead near Lowestoft on 26th August, 1898. Giraud says (Ann. Soc. Fr., 1877, p. 408) that he bred this species from the Dipteron *Sciara nigripennis*, probably in Austria. Halliday, in his Dublin Museum MS., claims to have taken it commonly in Ireland.

9. *ventralis*, Holmgr.

Orthocentrus ventralis, Holmgr. Sv. Ak. Handl. 1855, p. 338, ♀. *O. vittatus*, Holmgr. loc. cit. p. 339; Brisch. Schr. Nat. Ges. Danz. 1878, p. 109, ♂; Schr. Ges. König. 1871, p. 102, ♂ ♀. *Stenomacrus ventralis*, Thoms. O. E. xxii. 2437, ♂ ♀.

An infusate-testaceous and somewhat slender species. ♀. Head transverse and shining, very slightly constricted behind the eyes; frons subconvex, very smooth and a little impressed in front; face normally prominent, punctulate and red or badius; mandibles and palpi pale. Antennae slender, filiform, testaceous beneath and somewhat shorter than the body; basal flagellar joint conical and elongate, as long as the next two. Thorax somewhat narrower than head and black or badius with the prothorax and sternum more or less broadly ferrugineous; mesothorax convex, finely punctate and pubescent; metathorax discally smooth; petiolar area entire and basally emitting carinae, which represent apex of the wanting areola. Abdomen deplanate, oblong fusiform and a little longer than the head and thorax, with the anus not compressed; basal segment broad and a little dilated apically, finely scabriculous or aciculate, impressed laterally beyond its centre, and distinctly bicarinate nearly to its apex; second transverse and sculptured like the first but with no carinae, the thyridii distinct and rufescent, and the apical margin subtestaceous; third alutaceous and badius; the following testaceous and the concealed terebra very short and black; venter whitish. Legs slender, rufescent-testaceous with trochanters paler and apices of hind femora sometimes black-marked. Wings hyaline with stigma and nervures pale, tegulae whitish; radial nervure apically arcuate; areolet wanting and recurrent nervures approximate. Length, 3 mm.

The ♂ differs only in its more slender outline and colouration, which is testaceous or fulvescent-flavous throughout with only the vertex, nearly whole of frons, three indefinite mesonotal vittae, base and apex of abdomen nigrescent, the antennae apically infusate, and coxae and trochanters whitish.

Generally it is a little larger and stouter than *S. agilis*, to which it is very similar though constantly differing in the emission of the radial nervure from almost the apical third of the stigma; it has doubtless been much mixed with it in Britain.

Swedish woods in August (Holmgren) and Prussia (Brischke); and certainly not very rare with us. First recorded from Cornworthy in Devon in the middle of July by Bignell, who also took it at Clearbrook in the same county in the middle of August; Marshall found several at Cornworthy, a ♀ at Bishops Teignton in Devon, and a ♂ at Govilon in Monmouth. Beaumont has given me males (named *O. agilis* by Marshall) from Enniscorthy in Ireland and a ♀ from Taynuilt in Scotland, both taken early in September; Dr. Capron found the same sex in Surrey. Two probably hibernated ♀♀ occurred to me by beating *Pinus sylvestris* in the Bentley Woods, near Ipswich, on 2nd April, 1899.

10. *agilis*, Holmgr.

Orthocentrus agilis, Holmgr. Sv. Ak. Handl. 1855, p. 337, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 109, ♂ (*nec* 1871). *Stenomacrus agilis*, Thoms. O. E. xxii. 2439, ♀.

Shining, punctulate and dark piceous. Head of ♂ flavous with the vertex and frons to a little below its centre alone nigrescent, of ♀ black or piceous with the mouth, face, genal apices and apical margin of frons testaceous; apical joint of maxillary palpi somewhat shorter than penultimate. Antennae filiform and basally pale; of ♂ flavescent and as long as the body, of ♀ a little shorter and rufo-testaceous, in both apically infusate with the scape and basal flagellar joint of equal length. Thorax nigrescent with the prothorax, pleurae and sternum rufescent; areola wanting though basally indicated; petiolar area entire. Scutellum and postscutellum of ♂ testaceous, latter in ♀ sometimes fulvescent. Abdomen narrow and badius, of ♀ apically compressed and of ♂ sometimes discally pale-marked; two basal segments aciculate, with the first usually black; venter pale; terebra not reflexed, black and shortly exerted; ♂ styles elongate. Legs testaceous; ♂ with anterior coxae and trochanters whitish. Wings with tegulae whitish and areolet wanting. Length, $2\frac{1}{2}$ —3 mm.

A third smaller than *S. ridibundus* and more slender, with the second segment longer and body paler; of the size of *S. celer* and similar, but with the palpal and second segmental structure different; more like *S. exilis*, but much longer and at once known by its colouration and markings; says Holmgren.

In damp meadows in Sweden, during August, France, and in Prussia. It is recorded by Bignell from Ivybridge in Devon on 20th August, but must be considered doubtfully British, since specimens named by Marshall certainly belong to the last-described species, and I possess nothing but one extremely doubtful male from Piffard's Herts. collection, having the second recurrent nervure quite continuous with the submarginal and the thorax immaculate black. Brischke in 1871 gives this species as parasitic upon the Heteromerous beetle, *Heledona agaricola*, but in 1878 he describes it as a new species, *O. testaceipes*; it cannot be *S. agilis* since, as Thomson points out (*l.c.*), the areolet is entire.

11. *confinis*, Holmgr.

Orthocentrus confinis, Holmgr. Sv. Ak. Handl. 1855, p. 348, ♂ ♀. *Stenomacrus confinis*, Thoms. O. E. xxii. 2448, ♂.

A black and nitidulous species, with the legs fulvous. Head buccate, of ♂ with the mouth, face and antennal orbits flavous; of ♀ with the mouth and a facial fascia below the scrobes pale. Antennae basally flavescent beneath. Abdomen black and not broad; of ♂ often centrally badius, rarely testaceous; first and base of second segment alutaceous. Legs pale, with the hind coxae basally infuscate. Wings with tegulae stramineous, stigma broad and pale piceous; radial nervure apically curved. Length, $3\frac{1}{2}$ mm.

I have found this species by no means difficult to recognise, since it is the only one we have among those with no areolet and the recurrent nervures remote, that has the stigma broad, infuscate and distinctly rounded below, emitting the distinctly curved radial nervure from its exact centre.

It is very common with us, though not recognised till 1898, when Bignell recorded it from Ivybridge in Devon in the middle of September; he has, however, given me unnamed specimens which he took in September at Bickleigh as long ago as 1882; I also have examples from Bishops Teignton in Devon, Nunton in Wilts (Marshall), Shere (Capron), Aldeburgh in September and Bungay in June and October (Tuck). It is undoubtedly one of our commonest species, and my thirty specimens were all taken in June and September, as though there were two broods; in the former month the ♂ is not uncommonly met with in company with that of *S. laricis*, though usually in more marshy situations, on grass and reeds; Ranworth Broad, Norfolk; Tuddenham Fen, Mildenhall, Eriswell, Covehithe Broad, Reydon Marshes, Brandon staunch; and a small dark ♀ from beneath the leaves of a lime tree in my Monks' Soham garden. It has not yet been bred.

12. *intermedius*, Holmgr.

Orthocentrus intermedius, Holmgr. Sv. Ak. Handl. 1855, p. 344; Brisch. Schr. Ges. König. 1871, p. 103; Schr. Nat. Ges. Danz. 1878, p. 110, ♂ ♀. *Stenomacrus intermedius*, Thoms. O. E. xxii. 2447, ♂ ♀.

A shining, black and finely punctate species with pale legs. Head subbuccate and hardly constricted behind the eyes; frons subdeplanate and obsoletely punctate; face shining and normally protuberant; mouth and upper margin of ♀ face fulvescent, ♂ also with whole face flavous. Antennae longer than half body, basally testaceous beneath, 30—32-jointed with the basal flagellar joint cylindrical, longer than broad and the ♂ flagellum subserrate beneath. Metathoracic areae very distinct. Abdomen a little longer than head and thorax; basal segment not very broad, subelongate and aciculate, laterally impressed beyond its centre with carinae somewhat distinct; second longer than broad, aciculate towards its base, with distinct thyridii; venter flavous. Legs somewhat stout and fulvescent-flavous, with the hind coxae often nearly entirely black; ♂ with anterior coxae and trochanters paler. Wings with tegulae flavous; radial nervure apically nearly straight; stigma luteous and not broad with its lower margin not rounded. Length, 3—4 mm.

At once known by its narrow, luteous stigma emitting the externally straight radial nervure from its centre.

It is said to be uncommon in damp meadows during August on the Continent. First recorded with us in 1898 by Bignell, who took it at Bickleigh in Devon early in June; he has given me specimens thence and from Exeter, found in September; and Capron took it about Shere in Surrey. The ♀ has only thrice occurred to me in Suffolk: swept in Oulton Broad at the end of August, 1898; on flowers of *Angelica sylvestris* at Barton Mills at the end of August, 1900; and on reeds in the Southwold salt marshes, at the beginning of September, 1907.

13. *cognatus*, Holmgr.

Orthocentrus cognatus, Holmgr. Sv. Ak. Handl. 1855, p. 344, ♂ ♀.

Head very smooth, subbuccate and a little dilated behind the eyes; face normally prominent; mouth and in ♀ upper facial margin testaceous, ♂ also with the whole face flavous. Antennae filiform, somewhat longer than half body, basally dull testaceous and in ♀ a little stouter apically; basal and second flagellar joints of equal length, with the former hardly twice longer than broad. Thorax black and shining; areola and petiolar area in ♀ distinct, in ♂ subobsolete. Abdomen immaculate; basal segment not very broad, somewhat convex, laterally impressed beyond the centre, with the broadly separated carinae more distinct in ♀; two basal segments scabriculous throughout and the remainder very smooth; ventral plica basally pale; terebra not exerted. Legs dull testaceous, with the subincrassate hind femora and coxae piceous; the anterior femora, hind tarsi and apices of their stout tibiae infuscate. Wings subhyaline with the tegulae stramineous, nervures and narrow stigma pale; radial nervure somewhat curved at both extremities. Length, $2\frac{1}{2}$ mm.

This species will be recognised with us as the only one with transverse head, no areolet and the apically curved radius emanating from the centre of the narrow and pale luteous stigma. It is said to be similar to *S. tristis*, Holmgr., in colour and conformation but to differ in having the basal flagellar joint shorter, the head more buccate and the second segment scabriculous throughout.

In 1898 Bignell recorded it from Plym Bridge early in August and Bickleigh on 21st October, in Devon, on Bridgman's authority. It is certainly a common garden insect in Suffolk, where I have taken as many as thirteen females sitting and walking beneath the leaves of a lime tree in thundery weather, together with *S. deletus* and *S. concinnus* at 6 p.m. on May 24th, 1908, at Monks' Soham, as well as on house-windows on October 16th; a ♂ occurred to me at Brandon towards the end of August, 1906; Capron has given it me from Surrey, Bignell from Devon and Newbery from Crawley in Sussex and Tilgate Forest in 1902.

14. *exerens*, Thoms.

Stenomacrus exerens, Thoms. O. E. xxii, 2448, ♂ ♀.

A black species with the head cubical, legs pale, hind coxae black, radial nervure emitted almost before centre of the pale stigma; hind pulvilli not longer than their claws; ♂ with mouth and face pale; ♀ with terebra nearly as long as the basal segment. Length, $2\frac{1}{2}$ —3 mm.

Distinct in having the head not at all constricted posteriorly, the radius apically elongate, anal nervure emitted from centre of brachial cell, legs not slender and, unlike all its allies, the terebra elongately exerted.

Hitherto only known from Sweden; but I possess three females in Capron's Surrey collection.

15. *affinis*, Zett.

Bassus affinis, Zett. I. L. 379, ♀. *Orthocentrus affinis*, Holmgr. Sv. Ak. Handl. 1855, p. 347, ♂ ♀. *O. morionellus*, Holmgr. lib. cit. p. 341; Brisch. Schr. Ges. König. 1871, p. 102; Schr. Nat. Ges. Danz. 1878, p. 109, ♂ ♀. *Stenomacrus affinis*, Thoms. O. E. xxii. 2449, ♂ ♀.

A shining, punctulate and nigrescent species. Head subbuccate and not posteriorly constricted, with the mouth and in male both face and cheeks flavescens; vertex slightly emarginate; face normally prominent and subobsoletely punctate; frons deplanate. Antennae longer than head and thorax, testaceous beneath towards the base; basal flagellar joint in both sexes cylindrical and longer than broad. Thorax with metathoracic areae complete but stronger in ♀, or rarely (var. *morionellus*) entirely wanting. Abdomen with the venter pale; basal segment broad and as long as the hind coxae, a little convex, finely aciculate and beyond its centre laterally impressed; following segments very smooth. Legs testaceous and unusually slender; hind femora and tibiae not incrassate, and more or less piceous. Wings with pale tegulae; radial nervure emitted from centre of stigma and slightly but distinctly curved apically; anal nervure emitted from almost above centre of brachial cell. Length, 2—2½ mm.

I do not know this species, which appears badly defined, though Holmgren says it is easily known by the abdominal puncturation (only described as above) and slender hind legs; Thomson distinguishes it and its four Swedish allies from *S. everens* merely by the concealed terebra.

It is said to be common in Scandinavia from July to September and was introduced as British by Rev. T. A. Marshall in 1870; there are, however, no examples purporting to belong here in his own, Desvignes', Stephens', nor the British Museum collections, and I know not whence his record was derived.

16. *pusillus*, Zett.

Bassus pusillus, Zett. I. L. 379, ♂ (nec Holmgr.). *Orthocentrus Merula*, Holmgr. Sv. Ak. Handl. 1855, p. 349, excl. ♀ (nec Grav.). *O. ochripes*, Holmgr. lib. cit. p. 350, ♂. *Stenomacrus ochripes*, Thoms. O. E. xxii. 2446, ♂ ♀.

Head a little buccate with the frons smooth and subdeplanate; face strongly protuberant, shining, sparsely and finely punctate, of ♂ entirely or mainly flavous and of ♀ nigrescent with the upper margin testaceous. Antennae longer than half the body, piceous, paler below and especially basally; two basal flagellar joints subquadrate in ♀ or a little longer than broad in ♂. Thorax narrower than head, subcompressed, shining, punctulate, shortly pubescent and black; areola and petiolar area distinct. Abdomen somewhat longer than head and thorax; basal segment scabriculous, basally subintumescent and beyond its centre laterally impressed; second segment basally in ♀, and with basal half in ♂, aciculate; the following very smooth and shining. Legs normal and nigrescent

with the apices of coxae, of femora, the trochanters, tibiae and tarsi testaceous; anterior femora sometimes partly testaceous, the hind ones and their tibiae stout and the latter apically infusate. Wings apically broadly rounded, subinfumate, with stigma pale infusate; radial nervure externally very slightly curved, internally nearly straight. Length, $2\frac{1}{2}$ —3 mm.

This species was introduced as British, under the name of *O. merula*, Grav., by Marshall in 1870, but an examination of his examples in the Brit. Mus. shows them to appertain to Holmgren's description, which Thomson thought (O. E. 2446) to be synonymous with his own *S. ochripes* and Holmgren gives as "certissime" the same species as *B. pusillus*, Zett. To which of his own species to ascribe *B. minutus*, Zett., Thomson did not know.

There is a single pair in Marshall's collection from Cheltenham and Epping Forest, of which the ♂ has the face entirely pale, thus proving it to be Holmgren's and not Grav.'s species. It is said to be not infrequent throughout Sweden in marshy places and I have little hesitation in here placing numerous specimens in my collection, which I should with certainty ascribe to *S. affinis*, Zett., on account of their slender legs, were that species not said by Thomson, who examined Zetterstedt's types, to emit the radial nervure from the centre of the stigma, whereas in these it is given off distinctly before its centre.

I possess some forty examples taken by Bignell at Bickleigh during September, with the exception of five from the same locality on 21st and 22nd October; he has also given it me from Exeter, Newbery from Tilgate Forest in Sussex, Marshall from Bishops Teignton in Devon and Capron from Surrey. It is certainly rare in Suffolk, where I took it in the Bentley Woods on 29th May, 1902, and on reeds in the Southwold salt marshes on 14th September, 1907.

17. *binotatus*, Holmgr.

Orthocentrus binotatus, Holmgr. Sv. Ak. Handl. 1855. p. 346, ♀.

A shining, punctulate and black species, with pale legs. Head transverse and subbuccate, not constricted behind the eyes, shortly pubescent and shining; frons deplanate and smooth; face normally protuberant and very finely transaculate, piceous with the upper margin transversely ferrugineous; mandibles testaceous, with base and apex darker; palpi pale, with the last joint longer than penultimate. Antennae rather longer than half body, filiform and somewhat stout, testaceous beneath towards the base; basal flagellar joint subquadrate and very slightly longer than broad. Thorax stout and black, shining and discally punctulate; areola and the subperpendicular petiolar area entire. Abdomen compressed towards the anus; first segment and the second to beyond its centre scabriculous, former convex and behind the centre laterally impressed, and convergently bicarinate; second segment laterally testaceous; venter stramineous, terebra very short. Legs normal and testaceous with the femora above, and most of the hind coxae, nigrescent. Wings subhyaline; radix stramineous, the narrow stigma and nervures pale; radial nervure apically nearly straight. Length, 3 mm.

I have been unable to discover any exact distinction between this species, which much resembles *S. ambiguus*, Holmgr., in size and conformation, and the last-described, with which it agrees in the transverse

head and premedially emitted radial nervure; consequently I have had recourse to dividing them in my collection upon the general stoutness of the present species and slenderness of the last, especially in respect to that of the hind legs.

It is only known on the Continent from southern Lapland, but Marshall introduced it as British in his 1872 Catalogue on the strength of a correctly named female from St. Albans, still in his collection (though with it was a female *S. laricis*, Hal.). I possess a score of specimens from Taynult in Scotland in mid-September (Beaumont), Shere in Surrey (Capron), and several from Bickleigh in Devon at the end of October (Bignell); it has occurred to me by beating mountain ash, birch and hazel in woods in May at Bentley, by sweeping in marshes in June at Brandon and Eaton near Norwich, at Beccles on a flower of *Angelica sylvestris* in early September, and on reeds in Covehithe Broad on 1st October. Bignell's late dates, combined with a specimen I beat from a yew tree in a fir wood at Belstead as early as 20th March, 1903, go to suggest that this species hibernates in the perfect state.

18. *cubiceps*, Thoms.

Stenomacrus cubiceps, Thoms. O. E. xxii. 2447, ♂ ♀.

A small black species, with large head. Head cubical with the vertex, especially in ♀, distinctly broad and subdilated behind the eyes; genal sulcus wanting; face not pale. Antennae with the flagellar joints of ♀ well discreted and pilose, the first triangular and not or in ♂ hardly longer than the second. Abdomen immaculate with the venter black, at most basally pale. Legs pale, infusate-marked, in ♂ darker. Wings with the areolet wanting; radial nervure emitted before centre of stigma; anal nervure emitted from centre of brachial cell; recurrent nervures not approximate. Length, 2—2½ mm.

Known at once by its peculiarly broad head and the discreted ♀ flagellar joints; it was the first species of *Orthocentrides* I was enabled to recognise.

It has hitherto been known only from Sweden, but Capron took it at Shere, Bignell several at Bickleigh in early September, and I have met with it in Clare Island on the west coast of Ireland, at the base of the Corton cliffs at the end of August, on birch in the Bentley Woods and at Foxhall in the middle of May. Till Ichneumonidae are collected as carefully as Coleoptera we cannot tell the frequency of these very small species.

19. *silvaticus*, Holmgr.

Orthocentrus silvaticus, Holmgr. Sv. Ak. Handl. 1855, p. 342; Brisch. Schr. Ges. König. 1871, p. 103, ♂ ♀. *O. femoralis*, Holmgr. lib. cit. p. 346; Brisch. l. c. p. 103; Schr. Nat. Ges. Danz. 1878, p. 110, ♂ ♀. *Stenomacrus femoralis*, Thoms. O. E. xxii. 2445, ♂ ♀.

A shining, finely punctate and somewhat large, black species with sub-cubical head. Head buccate and subdilated behind the eyes; face and frons smooth, the latter unevenly impressed in front; ♂ with most of the face, and ♀ with the mouth and the face transversely below the scrobes, flavescent. Antennae basally flavescent beneath; basal flagellar joint of ♀ quadrate and of ♂ a little longer than broad, second of ♀ transverse

and in ♂ quadrate. Metathoracic areae obsolete or (var. *femoralis*) distinct. Abdomen not strongly punctate; first and base of second segments aciculate, the former longer than breadth of abdomen, obsoletely bicarinate and laterally impressed on either side beyond its centre; terebra not exerted. Legs pale testaceous with the posterior coxae and femora nigrescent; hind femora and tibiae stout; calcaria curved; claws and pulvilli small; ♂ with front coxae flavous beneath, and the anterior femora often black-rayed. Wings with no areolet; stigma infusate and emitting the basally slightly curved and apically nearly straight radius from its basal third; submarginal nervure short. Length, $3\frac{1}{2}$ —5 mm.

Very distinct in its large size, subcubical head and emission of radial nervure.

It is said to be not rare in marshy places in southern Lapland, from the end of July to that of September; and to be found in Prussia. I am enabled to record it from Britain on the strength of a couple of males, which I possess in Capron's Surrey collection.

TRIBE

BASSIDES.

This Tribe appears to be very closely related to the *Pimplinae* in its sessile and often coarsely sculptured abdomen, which is in the typical form very distinctly impressed in the same manner, though transversely and not obliquely, as is the abdomen of *Glypta* and many *Pimplae*. It forms, however, an entirely homogeneous group, at once distinguished from all other *Tryphoninae* and *Ichneumonidae* by its species' normal scutellum and apically bifid upper mandibular teeth, the peculiar conformation of the strongly deplanate and broadly sessile basal segment is also distinctive, and the general facies are so peculiar that, with a little experience, these insects may be known at a glance.

The name *Bassus*, apparently a word of no meaning (unless from Bassaris, who was a priestess of Bacchus, in allusion to these insects' frequency upon flowers^[1]), was first employed by Fabricius in his *Systema Piezatorum* of 1804; but the concurrence of species there assembled under this title is truly diverse and includes *Cryptinae*, *Pimplinae*, *Ophioninae* and even several kinds of *Braconidae* (cf. Curt. B. E. pl. lxxiii); several of its species, not one of which really belongs here, are still catalogued under this genus, simply because they have never been subsequently recognised. But *Bassus laetatorius*, universally regarded as its type, was not even included therein till so placed by Panzer in 1806! Gravenhorst recognised the Fabrician genus so little that in 1818 he proposed a new name, *Diplazon*, for it; nor can we at all suppose that he subsequently used this genus in the Fabrician sense, for it was originally described as having, *inter alia*, "corpus fere cylindricum, glabrum; antennis longitudine corporis; abdomine vix petiolato; aculeo varissime exserto." The genus as to-day represented by the Tribe *Bassides* was not, in reality, created until Fallen in 1813 published his "Specimen novam Hymenoptera disponendi methodum exhibens."

Bassus formed Gravenhorst's eighth group and was divided from *Metopius*, and the *Pimplinae* with convex abdomen, by having deplanate bodies with the basal segment flat and parallel-sided; in it he placed the genera *Euceros*, *Orthocentrus* and *Bassus*, of which the last two had the antennae not centrally incrassate and the latter differed from *Orthocentrus* in its more slender legs. From the remainder of the *Tryphoninae*, these three were said to differ in their entirely sessile abdomen. In 1855, Holmgren discovered that in Gravenhorst's restricted genus the upper mandibular tooth was apically bifid, which in all other *Ichneumonidae*, except certain *Metopii*, is entire; hence he erected a group for that genus alone, under the name *Tryphonides-schizodonti*. Desvignes, who in 1862 described eleven species considered by him to have been unknown to Gravenhorst, knew nothing of Holmgren's work. In 1868, Förster erected his foule of genera and divided the genus *Bassus*, Grav., into ten, giving the meagrest and often most trivial characters, with no indication of types: these genera are unfortunately being nowadays largely adopted, but I think with little justification, and only those

* More probably it was borrowed by Fabricius from another drunkard (cf. Horace, Od. I, xxxvi, 14) "Neu multi Damalis meri Bassum Threicia vincat amyntide"; or the Pompeian leader, Caelius Bassus, of B.C. 44, referred to by Livy (Epit. civ.), a member of whose family governed Alexandria under Tiberius, A.D. 38 (Philo in Flaccum).

are made use of here that have subsequently been more fully diagnosed and their species applied by later authors, of whom Thomson, in his masterly "Ofversigt af arterna inom släktet *Bassus*, Fab." (O. E. xiv. 1458), is certainly the foremost, though Vollenhoven, Bridgman, Brischke and others have assisted. Such of the palearctic species as I could find mentioned in my own library were tabulated and synonymised by me in 1905, but a few others have since come to my knowledge, notably six species described by Szépligeti of Budapest in the fifth volume of *Rovartani Lapok* in 1898 and *Homotropus sexcinctus* by Brauns (Term. Füz. 1896, p. 273); but none of these are British and consequently hardly affect my paper "On the Ichneumonidous Group *Tryphonides Schizodonti*, Holmgr." (Trans. Ent. Soc. 1905, p. 419). Pfankuch has since revised Gravenhorst's types.

The economy of the *Bassides* is extremely interesting, but although many have been bred from *Diptera*, apparently confining their attacks to the *Syrphidae*, which prey so exposedly and beneficially upon *Aphididae*, very few details of their economy are at present available and it is to be desired that some close observer will ere long give us the result of his scrutiny in this direction.* Personally I believe them confined to *Syrphidae*.

Table of Genera.

(2).	1. Basal segments deeply transimpressed	BASSUS, Fall.
(1).	2. Basal segments not or hardly im- pressed.	
(10).	3. Metathoracic spiracles small and black.	
(7).	4. Face dull and distinctly punctate.	
(6).	5. Notauli wanting; scape not deeply excised	HOMOCIDUS, Morl.
(5).	6. Notauli distinct; scape excised to centre	ZOOTREPHUS, Thoms.
(4).	7. Face glabrous and strongly nitidulous.	
(9).	8. Areolet wanting; abdomen partly red	PROMETHUS, Thoms.
(8).	9. Areolet present; abdomen entirely black	PHTHORIMUS, Först.
(3).	10. Metathoracic spiracles very large and pale	TRICHOMASTIX, Voll.



Bassus, mandible.

* On August 8th, 1908, I found great masses of *Aphis crataegi*, Kalt., on a small bush of *Crataegus oxyacantha* in my garden at Monks' Soham House, Suffolk; they were by no means confined to the shoots, as suggested by Buckton, but were on both the underside of the much-curved but quite green leaves and upon the stems of last year's growth; none were winged. They were so numerous as to attract numbers of insects to their abundant secretion; I noted, *inter alia*, the *Diptera Homalomyia canicularis*, L., *Morellia hortorum*, Fln., *Calliphora erythrocephala*, Mg., and *C. vomitoria*, L., *Hyetodesia erratica*, Fln., *et spp.*, *Lonchaea vaginalis*, Fln., *Sepsis punctum*, F., *Hydrotaea irritans*, Fln., *Tachista sp.*, etc.; and many *Lasius niger* were sucking their cornicles. Three or four *Bassus tricornatus*, Grav., were flying round them doubtless in search of *Syrphid* larvae, of which I saw one. One *Bassus*, I noticed, brought her abdomen up in front of her face, intruded it to the base of a leaf-stem, then straightened out her body and kept her terebra stationary (exactly as represented by Westwood, Introd. p. 140, fig. 76, 1), as though ovipositing, for half a minute; but I could find neither egg nor possible host *in situ*. The next morning I also saw among the *Aphididae* *Ascia podagrica*, Fab., *Sepsis cynipsea*, L., *Phorbia spp.*, an ovipositing *Syrphus balteatus* (though I could find no eggs), *Glypta flavolineata*, Grav. and *Trypoxylon attenuatum*, Sm. Two of the female *Aphids* were now

BASSUS, Fallén.

Fall. Specim. Hym. (1813); Thoms. O. E. xiv (1890), p. 1465.

Head with the cheeks short, clypeus apically emarginate centrally, face not smooth, mandibles stout and discally deplanate; ♀ with internal orbits, ♂ face entirely or mainly, white. Antennae not or hardly extending beyond apex of thorax, with flagellum filiform and in ♀ slightly incrassate towards the apex, of ♂ with no elevated lines and 10—18 joints. Thorax white-marked, with notauli short but distinct, the metathorax areolated and the spiracles at an appreciable distance from the lateral carinae. Abdomen not apically compressed; the anterior segments distinctly impressed transversely, and somewhat strongly and subrugosely punctate; basal segment with discal carinae entire or at least extending to its centre. Legs not slender; hind tibiae broadly white centrally, and nigrescent at both extremities. Wings with no areolet and the submarginal nervure not approximating the second recurrent.

The very distinctly transimpressed basal segments will at once distinguish this genus from the remainder of the *Tryphoninae* and the allied *Bassides*.

Table of Species.

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| (6). | 1. Anterior coxae entirely pale; abdomen centrally red. | |
| (5). | 2. All the coxae pale. | |
| (4). | 3. Abdomen broadly red; hind tibiae tricoloured | 1. LAETATORIUS, Fab. |
| (3). | 4. Abdomen not or hardly red; hind tibiae bicoloured | 2. TRICINCTUS, Grav. |
| (2). | 5. Hind coxae basally black; central segments red-banded | 3. MULTICOLOR, Grav. |
| (1). | 6. Anterior coxae not entirely pale; abdomen rarely red-marked. | |
| (8). | 7. Hind coxae red; basal segment apically pure white | 4. ALBOSIGNATUS, Grav. |
| (7). | 8. All the coxae black; basal segment not white-marked. | |
| (10). | 9. Apices of hind tibiae black; ♀ epistoma white-marked | 5. VARIICOXA, Thoms. |
| (9). | 10. Apices of hind tibiae ferrugineous; ♀ epistoma immaculate | 6. ANNULATUS, Grav. |

winged. The same evening I further noticed *Pollenia rudis*, F., sucking the Aphids; the bush was then covered with flies, with *Bassus lactatorius* and other species of this genus, *B. tricornatus* being common. The same bush was again covered with this Aphid, both winged and apterous, on its new shoots on July, 29th, 1909. At 10.0 a.m. I saw a *Syrphus corollae*, Fab., ovipositing among them. She appeared to pay no especial attention to the position in which she placed the eggs, though in every case they were deposited on the leaf or stem of the plant amid the thickest masses of Aphids, usually pushing aside some immature Aphid to do so, in such a way that after deposition the egg was half concealed by the latter's body. The egg is subcylindrical, one mm. in length and rather more than a quarter mm. in breadth at its broadest point, which is slightly before the centre; its apex is entirely rounded and thicker than its base, which after curving inwards a little becomes truncate, as though abruptly cut off by contraction of the ovipositor. The colour is pure white and the surface is beautifully reticulate. Among the Aphids were also *Hytodessa basalis*, Zett., and *Pollenia rudis*, F. On 2nd July the egg had become olive-green beneath its white shell and one streak showed light grass-green; on 4th the stramineous, black-spined larva had emerged and was very active.

1. *laetatorius*, Fab.

Ichneumon laetatorius, Fab. S. I. i. 424; M. I. i. 262; Piez. 63; Panz. F. G. xix. 19. *Anomalon lactatorius*, Jur. Nouv. Méth. 116, ♀. *Bassus lactatorius*, Panz. Krit. Revis. ii. 74; Gr. I. E. iii. 353; Zett. I. L. 377; Ratz. Ichn. d. Forst. ii. 109; Holm. Sv. Ak. Handl. 1855, p. 353, pl. ix, fig. 24; Voll. Pinac. pl. 1, fig. 1; Thoms. O. E. xiv. 1470; Davis, Trans. Amer. Ent. Soc. 1895, p. 21; Morl. Trans. Ent. Soc. 1905, p. 425, ♂ ♀; Froggatt, Austral. Ins. 1907, fig. 50. *B. albo-varius*, Wollaston, Ann. Nat. Hist. 1858, (i), p. 23, ♂. *B. tripicticus*, Walsh, Trans. Acad. St. Louis, 1873, p. 85. *B. venustus*, Sauss. Grand. Hist. Madagascar, pl. xv, fig. 23, ♂. *Scolobates varipes*, Smith, Trans. Ent. Soc. 1878, p. 3, ♀; cf. Hudson, Entom. 1884, p. 171 et Manual New Zealand Entom. 1892, 39, pl. iii, fig. 8; Smith, E. M. M. 1900, p. 161.

A shining and distinctly punctate species, black with the scutellum and centre of hind tibiae white, the abdomen centrally and apex of hind tibiae red. Face punctulate, clypeus discreted and apically emarginate. Mouth, facial orbits, a mark before the concolorous tegulae, scutellum and postscutellum, white; antennae beneath, the legs and centre of abdomen



more or less broadly, red; hind tibiae basally black and black beyond with pure white central band, with the apex broadly red. Metathorax subrugose with its areola short, entire and subtransverse. Abdomen deplanate and not apically compressed, with the three first segments strongly punctate or subcabriculose, bearing a distinct transverse impression behind the centre of each; basal segment subquadrate, centrally elevated and bicarinate to the apical impression. Length, $3\frac{3}{4}$ —7 mm.

The extent of the red abdominal colouration is the only variable feature of this very constant species; usually it extends throughout the second and third segments, but I possess females with the whole of the four basal segments red and others with the colour restricted to the extreme apex of

the second segment. Pfankuch remarks upon the extreme rarity of males in this species; with us both sexes are almost equally common.

The tricoloured hind tibiae will instantly distinguish it from all other *Bassides*.

This is a very abundant species with us and is one of the most cosmopolitan of all Ichneumonidae; Ashmead says its distribution extends throughout Europe, Asia, Africa, Australia, New Zealand, Chatham Islands, Hawaii, Japan, the West Indies, and both North and South America; I have specimens from India (Quetta), Bucharest, etc., and it is common in the Canary Islands. In Britain it is found from the Isle of Wight to Whitby and the Isle of Man; but I have heard of no Scotch captures, though it doubtless occurs there and was, according to his MS. in Dublin Museum, found commonly by Haliday in Ireland.* It first appears on 27th May, is most abundant from the end of July to the beginning of September, and my latest date of capture is the 23rd of the latter month. That it is attracted by artificial light is, I think, proved by my finding one sitting on a table beneath a lamp during the evening of 31st July, 1900; and I have frequently seen it on the inside of windows. It is most commonly found by sweeping, but may often be observed upon the leaves of horseradish, on oats, reeds and the flowers of *Heracleum*, *Angelica*, *Statice*, *Achillea* and thistles, not uncommonly in salt-marshes, though it has no especial penchant for damp situations. On 25th to 29th July, 1899, I noticed that the females were exceedingly abundant upon *Polygonum* growing at the base of a corrugated iron paling on the beach at Slaughden; they were running up and down the stems and leaves, poking both antennae at once into the cups surrounding the base of the branches and keenly searching for some host which was invisible to me. This species was first bred by Ratzeburg from the larva of some *Syrphus* fly in Saxony; subsequently Dr. Giraud raised it (Ann. Soc. Fr. 1877, p. 408) from *Syrphus balteatus* and another species, the MS. *B. pipizae*, Gir., from *Pipiza noctiluca*; Brischke says of it "aus *Syrphus*-Maden erzogen," in Prussia; and its association with these flies, which prey on *Aphididae*, was suggested by Gravenhorst, who tells us that it was captured among *Aphides* near Helmstadt, as well as upon umbels. Van Vollenhoven says (Pinac. pl. 1) that it had long ago been noticed that this species is parasitical to the larvae of *Syrphus Pinastris* (= ? *corollae*); but his other records of its emergence (copied from Kirchner, Cat. 84) from a larva of the phytophagous Coleopteron, *Adimonia rustica*, Schall. (= *pomonae*, Scop.) and from *Tortrices* are most probably errors. Bignell bred a specimen (Entom. 1884, p. 167) from the indurated larval skin of an unknown species of *Syrphus* on 3rd June, 1884, which he had found during the preceding October in Oreston Quarry, in Devon, preying upon *Aphis jacobaeae*, Schr.; he adds that the host-larva had entered its puparial state at the end of October, and remained quiescent till the parasite's emergence. In his South Devon list of 1898, he says (p. 42) that "this is a common parasite on the larvae of the Hovering fly (*Syrphus*), the larvae of which

* Detailed localities:—Alderney, Lands End and Cremyl in Cornwall, Newton Abbot, Cornworthy, Bickleigh and Ivybridge in Devon, Portland undercliff and Isle of Purbeck, Glanvilles Wootton, Littlehampton, Hastings and Guestling in Sussex, the Deal sandhills, Abinger Hammer, Guildford, Shere and Greenings in Surrey, Plumstead, Chiswick and Acton, Felken in Herts, Shotover near Oxford, St. Albans, Nunton in Wilts, East Ilsley in Berks, Redland near Bristol, Nottingham, and Cadney in Lincs.; Gosfield in Essex, West Ranton, Hunstanton and Kings Lynn in Norfolk, Timworth, Tostock, Aldeburgh, Benacre Broad and Oulton Broad in Suffolk, Lastingham, Storthes Wood and Whitby in Yorks, Isle of Man. I have taken it at Kyde and Norton Wood in the Isle of Wight, Lyndhurst in New Forest, at Holme, Filby Broad, Horning and Cromer in Norfolk, at Peterborough; and in Suffolk at Southwold, Easton Broad, Barton Broad, Tuddenham Fen, Barton Mills, Sotherton, Lackford, Finborough Park, Felixstowe, Slaughden, Dodnash, Claydon bridge, Lowestoft, Corston, Henstead, Barnby Broad and in my paddock at Monks' Soham.

feed exclusively on different species of *Aphis*." Early in September, 1907, I found it swarming on reeds at Southwold, which were infested by myriads of the Aphid, *Hyalopecterus arundinis*, Fab., and I captured one female in the act of investigating the leaves they were on, though not ovipositing. Bankes has, however, kindly given me a female, bred by him in the Isle of Purbeck in 1902, together with the Syrphid puparium from which it had emerged; the latter is entirely identical with others from which I have raised *Syrphus balteatus*, probably the usual host of this ubiquitous insect.

2. *tricinctus*, Grav.

Bassus albosignatus, var. 4, Gr. I. E. iii. 345, ♂. *B. tricinctus*, Gr. lib. cit. 351, ♂; Morl. Trans. Ent. Soc. 1905, p. 425, ♂ ♀; cf. Brisch. Schr. Nat. Ges. Danz. 1878, p. 111. *B. flavolineatus*, Zett. I. L. i. 378, excl. ♀ et var. (nec Grav.). *B. nemoralis*, Holmgr. Sv. Ak. Handl. 1855, p. 354; Voll. Pinac. pl. i, fig. 3; Thoms. O. E. xiv. 1469, ♂ ♀.

A distinctly punctate species with the abdomen not or obsoletely red-marked. Mouth, clypeus, facial orbits and in ♂ epistoma, marks before the concolorous tegulae, scutellum apically or entirely, and hind tibial band, white. Legs totally red with only the hind tarsi, and remainder of their tibiae entirely, black. ♂ with scape beneath and anterior coxae entirely flavous; areola very small and irregular. Three first segments transversely impressed and (in form typ.) apically red; basal segment subquadrate, rugosely punctate and impressed before the centre, with discal carinae extending nearly to the anteapical impression. Length, 4—5½ mm.

Holmgren's variety *nemoralis* differs from the type form only in having the abdomen immaculate black; it is much commoner with us than that with the incisures red, as was described by Gravenhorst.

Smaller and less stout than *B. albosignatus* with the frons very finely and more sparsely punctate, the areola irregular, the basal segment slightly broader and not apically white. From all the other species of this genus, except the rare *B. multicolor*, it is at once known by its entirely pale, red or flavous, anterior coxae and the bicoloured hind tibiae.

This is an extremely common species and I have heard of it or seen it from Nunton in Wilts and Botusfleming in Cornwall (Marshall), Shere (Capron), Plymstock, Croydon and Hunstanton (Brunetti), Redland and Bristol (Charbonnier), Hastings (Esam), New Forest (Miss Chawner), Tarrington, Hereford (Yerbury), Chatham (Garde), Guildford (Butler), Askrigg in Yorks and Banchory in Scotland (Elliott), Tostock, Benacre and Bungay (Tuck), Kilmore in Ireland, Whitby and Blackheath (Beaumont), Isle of Mull (Tomlin), Isle of Portland and Barmouth (Bradley), Gullane and Edinburgh (Evans), Basingstoke (Hamm), on hemlock in Wigtonshire (Gordon), Blackburn (Bowdler), Kings Lynn (Atmore), Exminster and Plym Bridge (Bignell). It is frequently taken by sweeping, but more usually at the heads of both *Heracleum* and *Angelica*, quite as often in their seeding, as in their flowering condition, and is on the wing from 20th May to 14th September. On 24th June, 1899, I took a female investigating a thistle-stem (*Onopordon acanthium*), covered with *Aphis cardui*, Linn., on the bark of the Gipping at Blakenham, with several *Pemphredon* and *Pimpla graminellae* (cf. Ichn. Brit. iii. 60); and on 26th July, 1904, one was probing the stem of *Heracleum sphondylium* in an Ipswich garden with her antennae, it walked over the flowers heedlessly, but was very interested in *Aphis hieracii*, Kalt., which covered the plant, doubtless in search of the larvae of some *Syrphidae*, from which family I

am not aware that it had been bred, till Mr. H. J. Charbonnier kindly gave me a female together with the puparium, from near the capital extremity of which it had emerged, labelled, "bred from pupa of *Platychirus albinus* on 6th August, 1909, at Shepton Mallet in Somersetshire."

3. *multicolor*, Grav.

Bassus multicolor, Gr. I. E. iii. 352, ♀; Voll. Pinac. pl. i, fig. 4, ♂; Holmgr. Sv. Ak. Handl. 1855, p. 355; Morl. Trans. Ent. Soc. 1905, p. 425, ♂ ♀. (?) *B. deletus*, Thoms. O. E. xiv. 1471, ♂ ♀.

A punctulate and somewhat shining species. Head with the mouth, disc or in ♂ whole of clypeus, internal orbits or in ♂ whole face, flavous; frons smooth and canaliculate. Antennae black, filiform and shorter than the body with flagellum ferrugineous beneath; scape of ♂ flavous beneath. Thorax black, stout and gibbous, with a mark before and short line beneath the radices flavous; pleurae strongly nitidulous and obsoletely punctate; metathorax rugulose with the areae obsolete and areola very small. Scutellum and postscutellum flavous. Abdomen deplanate, black with the second to fourth segments more or less broadly, usually with their apical half, red or badius and transversely impressed; basal segment scabriculous, basally impressed and in ♀ apically white; the gastrotrocoeli of the second distinct; terebra subexserted. Legs fulvous; coxae flavous with the hind ones always basally black; hind tibiae broadly white with the base and before apex black, the extreme apex at least internally being red. Wings slightly clouded with the stigma and radius infuscate, tegulae and radix flavous. Length, 5 mm.

Pfankuch thought *B. deletus* synonymous with *B. multicolor*, Holmgr., but distinct from *B. multicolor*, Grav.; he gives no distinctions.

This is certainly a rare species; Gravenhorst knew but three females, captured in Piedmont; Holmgren records it from Sweden in August; Thomson from Denmark; Brischke the male from Prussia; Tosquinet gives it from Belgium; and it is by no means rare in India. It has long stood in our lists, but the earliest record I can find is by Rev. E. N. Bloomfield in the Natural History of Hastings, where it is recorded from Guestling in the 2nd Supplement, p. 9, under the name *B. pictus*, Gr., corrected in the 3rd Supplement, p. 14, and by me in the Vict. Hist. Sussex. Bignell has captured it at Crabtree in Devon, on 28th August; there are three males in Dr. Capron's collection, probably from Shere in Surrey. My own experience extends to the capture at Horning Ferry in the Norfolk Broads of eight males on the 15th June, 1901, and another specimen of the same sex in Tuddenham Fen, in Suffolk, on the 19th of the same month; it is certainly extremely local and probably confined to very marshy places. It has not yet been bred.

4. *albosignatus*, Grav.

Bassus lactatorius, Panz. F. G. c. 14; cii. 18, ♀ (*nec* Fab.). *B. albosignatus*, Gr. I. E. iii. 343, ♀ ♂, excl. varr. 1, 2, 4; Ratz. Ichn. d. Forst. i. 122, pl. vii, fig. 7; Holmgr. Sv. Ak. Handl. 1855, p. 354, excl. var. 3; Voll. Pinac. pl. i, fig. 2; Thoms. O. E. xiv. 1466; Brisch. Schr. Nat. Ges. Danz. 1891, p. 63; Morl. Trans. Ent. Soc. 1905, p. 425, ♂ ♀. *B. flavolineatus*, var. b, Zett. I. L. 378, ♂ ♀.

A stout and somewhat large black species with the mouth, clypeus, facial orbits, ♂ but not ♀ epistoma marked with, marks before the concolorous tegulae, most or all of the scutellum, and the hind tibial band,

white. Apex of basal segment conspicuously white. Legs red with the anterior coxae partly but not the hind ones, the hind tarsi and whole of the remainder of their tibiae, black. Abdomen not red-marked. Length, $7\frac{1}{2}$ mm.

Instantly known from all the preceding by its conspicuously white apex of the basal segment, larger size and much stouter conformation; and distinguished by the basally black anterior but immaculate red hind coxae, stouter and more deeply impressed abdomen.

This handsome species is by no means common with us and I have but twice met with it personally; in July, 1903, it was sucking the stylopods of *Heracleum sphondylium* on the cliffs at Southwold in Suffolk; and at the end of the same month, 1904, I captured another flying along among marram grass on the sea-shore at Kessingland, some five miles further north. I have examples taken by Peacock at Cadney in Lincs. and by Col. Yerbury at Nairn in Scotland in the middle of July, 1904; Bignell has recorded it from Bickleigh and the Walkham Valley, in Devon, on the 3rd of June and of August; Haliday, in his Dublin Museum MS., says it was found commonly by him in Ireland; and Rev. T. A. Marshall tells us (Entom. 1872-3, p. 432) that Francis Walker captured it in the Isle of Man, and he himself took it at Botusfleming in Cornwall. On the Continent it was for long intermingled with *B. tricinctus*; Holmgren in Sweden and Brischke in Prussia have bred it from a *Syrphus* pupa, and Bouché once raised it (Naturg. 147) from a puparium of *Syrphus balteatus*, as quoted by Ratzeburg (*l.c.*), Curtis (Farm. Ins. 82), Kirchner and Gaulle.

5 *varicoxa*, Thoms.

Bassus albosignatus, var. 1, Gr. I. E. iii. 344, ♀ (?); var. 3, Holmgr. Sv. Ak. Handl. 1855, p. 354. *B. varicoxa*, Thoms. O. E. xiv. 1460; Morl. Trans. Ent. Soc. 1905, p. 425, ♀.

A black species with the mouth, clypeus, facial orbits, epistoma, marks before the concolorous tegulae, more or less of scutellum, and the hind tibial band, white. Legs red with the anterior coxae basally and hind ones entirely, hind tarsi and whole of the remainder of their tibiae, black. Abdomen rarely obsoletely red-marked. Length, $4-5\frac{1}{2}$ mm.

This is another female closely allied to *B. tricinctus*, from which it differs in its partly black anterior coxae and entirely concolorous hind ones; and from *B. annulatus* in its white-marked epistoma and lack of all rufescent colouration at the apex of its hind tibiae, the more deeply impressed incisures, and the larger humeral and scutellar pale markings. It is distinguishable from *B. albosignatus* by its shorter hind tarsi and claws, more finely punctate metathorax, frons and pleurae, and hardly traceable areola.

It is of fairly frequent occurrence with us and appears to be gregarious, since I have very rarely taken it singly. Mousehold, near Norwich (Bridg. Trans. Norf. Soc. v. 628); Braidburn, near Edinburgh in July, 1899 (Evans); I have it from Point of Aire (Tomlin); Brislington, near Bristol (Charbonnier); St. Kilda (Waterston); and Felden in Herts (Piffard). In Suffolk, Tuck has found it at Finborough Park and Tostock; and I have taken it occasionally by sweeping on flowers of *Angelica*, *Heracleum*, etc., from June 1st to August 30th at Tuddenham Fen, Raydon Wood, Dunwich, Keydon marshes, Claydon bridge, and in

my paddock at Monks' Soham; as well as at Kirtling, in Cambridge-shire. It is very widely distributed on the Continent, and I have seen it from as far east as India.

6. annulatus, Grav.

Bassus albosignatus, var. 2, Gr. I. E. iii. 344, ♂ ♀ (?). *B. annulatus*, Gr. lib. cit. 348, ♀; Thoms. O. E. xiv. 1468; Morl. Trans. Ent. Soc. 1905, p. 425, ♂ ♀.

A black species with the mouth, clypeus, facial orbits, ♂ but not ♀ epistoma, marks before the concolorous tegulae, more or less of scutellum, and the hind tibial band, white. Legs red with the anterior coxae basally and hind ones entirely, hind tarsi and remainder of their tibiae except at apex, black. Abdomen rarely obsoletely red-marked. Length, 4—5 mm.

This species is so closely allied to the last-described that I am not persuaded that it is distinct; it may be known, however, by the partly black anterior coxae and entirely black hind coxae, the apically rufescent hind tibiae and generally more slender conformation.

It is not very common with us and has been much mixed with the preceding; and on the Continent has only been recognised in Scandinavia and Frankfort. I have seen specimens captured by Prof. Carr about Nottingham in July, by Marshall at Botusfleming in Cornwall, by Capron about Shere in Surrey, and by Tuck at Bungay on 14th July, and Finborough Park in Suffolk on 24th September, which dates appear to represent this species' duration in the perfect state in Britain. I have only met with it from 22nd to 26th August, 1899, when I took five specimens on the flowers of *Angelica sylvestris* in a marshy spot by the river Gipping at Claydon bridge in Suffolk.

HOMOCIDUS, n.n.

Face finely and densely alutaceo-punctate, dull and neither smooth nor longitudinally impressed; cheeks somewhat short; mandibles usually deplanate discally and a little constricted apically. Antennal scape neither short nor deeply excised; flagellum sometimes apically subattenuate. Thorax with pleurae not glabrous; notauli obsolete or wanting; metathorax with spiracles small and at some distance from the pleural margin, areae usually not always obsolete. Abdomen usually black, of ♀ rarely strongly and never falcately compressed apically; segments not transversely impressed; postpetiole with or without discal carinae. Areolet irregular and entire, or wanting.

Förster's name *Homotropus* (Verh. pr. Rheinl. 1868, p. 162; used also by Waterhouse for Coleoptera in 1878) cannot be applied to this genus since at present constituted, it comprises species with and without areolet and petiolar carinae; *Homotropus* must, I think be confined to the *dimidiatus*, and, perhaps, *elegans* groups of species. Nor can we adopt *Homoporus*, Thomson (O. E. 1890, 1488), since the same author had already (Hym. Scand. 1878, 04) applied it to a genus of Pteromalid Chalcididae. I have, consequently, had to erect a new name, which is used to exactly coincide in extent with *Homoporus*, Thomson, 1890. To erect genera upon the stability of the areolet of these instable insects is as useless as has been the erection of species solely upon their colouration, the synonymy of which is become somewhat cumbersome.

Table of Species.

- (22). 1. Areolet wanting; anus of ♀ not compressed.
- (13). 2. Metanotal areae not entirely wanting.
- (10). 3. Second segment transverse; anus often somewhat dull.
- (9). 4. Basal area distinct and entire; hind tibiae not white.
- (8). 5. Notauli wanting; scutellum pale.
- (7). 6. Femora entirely, abdomen not broadly, red 1. CINCTUS, *Grav.*
- (6). 7. Femora basally black; abdomen usually broadly red 2. BIZONARIUS, *Grav.*
- (5). 8. Notauli distinct; scutellum black 3. OBSCURIPES, *Holmgr.*
- (4). 9. Basal area obsolete; hind tibiae white; thorax rufescent 4. PECTORATORIUS, *Grav.*
- (3). 10. Second segment quadrate; anus strongly nitidulous.
- (12). 11. Clypeus convex; antennae shorter than expanded wing 5. CAUDATUS, *Thoms.*
- (11). 12. Clypeus deplanate; antennae as long as expanded wings 6. PUNCTIVENTRIS, *Thoms.*
- (2). 13. Metanotal areae entirely wanting [? SYRPHOCTONUS, Först.].
- (21). 14. Vertex more or less emarginate; scutellum apically or entirely pale.
- (20). 15. Scutellum partly pale; hind tibiae nigrescent, always basally white.
- (19). 16. Face parallel-sided; post-petiole not quadrate.
- (18). 17. Metathorax not red-marked 7. BIGUTTATUS, *Grav.*
- (17). 18. Metathorax broadly red laterally 8. ABDOMINATOR, *Bridg*
- (16). 19. Face apically dilated; postpetiole quadrate 9. FLAVOLINEATUS, *Grav.*
- (15). 20. Scutellum entirely pale; hind tibiae red, apically nigrescent 10. TARSATORIUS, *Pz.*
- (14). 21. Vertex not emarginate; scutellum only laterally pale 11. FISSORIUS, *Grav.*
- (1). 22. Areolet present, or anus of ♀ strongly compressed.
- (46). 23. Hind tibiae usually partly white; no abdominal segment entirely red.
- (31). 24. Petiolar carinae strong and usually long; tibiae not mainly white.
- (28). 25. Hind tibiae basally clear white.
- (27). 26. Postpetiolar carinae parallel 12. ORNATUS, *Grav.*
- (26). 27. Postpetiolar carinae convergent [? ENIZEMUM, Först.]. 13. DEPLANATUS, *Grav.*
- (25). 28. Hind tibiae not at all white.
- (30). 29. Clypeus not apically excised; scutellum black 14. NIGER, *Morl.*
- (29). 30. Clypeus apically excised; scutellum pale 15. SUNDEVALLI, *Holmgr.*
- (24). 31. Petiolar carinae short or wanting; hind tibiae usually white [? HOMOTROPUS, Först.].
- (45). 32. Scutellum not entirely pale, nor ♀ anus strongly compressed.

- (44). 33. Scutellum of normal size and convexity.
(41). 34. Clypeus laterally foveate.
(40). 35. Clypeus apically not reflexed nor entire.
(39). 36. Clypeus apically emarginate and not laterally elevated.
(38). 37. Hind tibiae hardly dark basally; ♂ sternum pale-marked 16. DIMIDIATUS, *Schr.*
(37). 38. Hind tibiae basally infusate; ♂ sternum entirely black 17. PUMILUS, *Holmgr.*
(36). 39. Clypeus apically excised and laterally elevated 18. INCISUS, *Thoms.*
(35). 40. Clypeus apically reflexed and entire 19. REFLEXUS, *Morl.*
(34). 41. Clypeus not laterally foveate.
(43). 42. Second segment transverse; hind tibiae stout 20. CRASSICRUS, *Thoms.*
(42). 43. Second segment elongate; hind tibiae normal 21. LONGIVENTRIS, *Thoms.*
(33). 44. Scutellum large and somewhat strongly convex 22. STRIGATOR, *Fab.*
(32). 45. Scutellum entirely pale; anus of ♀ strongly compressed. 23. XANTHASPIS, *Thoms.*
(23). 46. Tibiae not white; abdomen nearly always broadly red centrally. 24. EMARGINATUS, *Morl.*
(52). 47. Scutellum not entirely black, or basal segments scabrous.
(49). 48. Scutellum at most apically pale; second segment punctate 25. ELEGANS, *Grav.*
(48). 49. Scutellum mainly pale; second segment subglabrous.
(51). 50. Areolet entire; second segment elongate 26. PALLIDIPES, *Grav.*
(50). 51. Areolet wanting; second segment transverse 27. PULCHER, *Holmgr.*
(47). 52. Scutellum entirely black; basal segments not scabrous [? ANIAROPHRON, Först.].
(54). 53. All the coxae pale; areolet entire 28. SIGNATUS, *Grav.*
(53). 54. Hind coxae more or less black; areolet wanting 29. HYGROBIUS, *Thoms.*

1. cinctus, *Grav.*

Bassus cinctus, Gr. I. E. iii. 327; Holmgr. Sv. Ak. Handl. 1855, p. 356; Voll. Pinac. pl. i, fig. 6, ♂; Tijds. v. Ent. 1878, p. 162, ♀. *B. lateralis*, Gr. I. E. iii. 342, "♂"; Holmgr. Sv. Ak. Handl. 1855, p. 355; Voll. Pinac. pl. i, fig. 5, ♂ & ♀. *B. scabriculus*, Holmgr. loc. cit. *B. albicinctus*, Desv. Trans. Ent. Soc. 1862, p. 218, ♂. *B. hyperboreus*, Marsh. E. M. M. xiii. (1877), p. 241, ♂. *Homoporus lateralis*, Thoms. O. E. xiv. 1492, ♂ & ♀. *H. cinctus*, Morl. Trans. Ent. Soc. 1905, p. 426, ♂ & ♀.

Nitidulous, punctulate, black. Head fully as broad as thorax; frons anteriorly impressed and subcanaliculate; mouth, clypeus, ♀ inner orbits and ♂ whole face flavous. Antennae shorter than the body; scape of ♂ stramineous beneath. Thorax stout and gibbous with (form typ.) or without (var. *scabriculus*) a mark before the pale tegulae and rarely in ♂ (var. *albicinctus*) pleural suture and pale spots, flavous; areola quite distinctly delineated, entire, transverse or subquadrate; metathorax sub-

rugulose. Scutellum and sometimes postscutellum apically stramineous. Abdomen with the subscabriculous three or four basal segments apically flavescent throughout (form typ.) or with their lateral angles alone pale (var. *lateralis*); basal segment of ♀ subquadrate, of ♂ a little longer than broad, basally dilated with the discal carinae not very distinct. Legs red, with the hind tarsi and apices of their tibiae nigrescent; anterior coxae entirely and hind ones apically, with all the trochanters, flavous. Wings with transverse anal nervure intercepted in or slightly below the centre. Length, $3\frac{1}{2}$ —6 mm.

Holmgren says the var. *scabriculus* has the frons more distinctly sulcate, the clypeus more deeply sinuate apically, no pale mark before the radices and the transverse anal nervure intercepted nearly in the centre. All the forms are of equal frequency with us, and one of my Scotch females has the abdomen wholly black. I have examined the type of Marshall's Spitzbergen species in the British Museum.*

This is the earliest of all the Bassides to appear in the perfect state; it is distributed through Belgium, Holland, France, Sweden and Germany, where it occurs on umbels in September, etc. With us it would almost appear to be double-brooded, since it is commonest from 6th May to the middle of June and is then not found till August, when it is abroad till 25th September; I have never found it in July. It is recorded from the Lands End by Marquand, Lynn by Atmore, Brundall and Eaton by Bridgman, Bickleigh in June and August by Bignell, and the Isle of Man by Marshall, who also took it at Cornworthy, Nunton in Wilts and Darenth Wood; I have seen it from South Leverton in Notts. (Thornley), Golspie in Scotland (Yerbury), Lenzie in Scotland in June (Malloch), North Berwick and Birnam in Perth (Elliott), Devonport and Blastne (Garde), and Shere (Capron). It is not infrequent in Suffolk on birch and other bushes in woods in the spring and on the flowers of *Angelica* in the autumn at Bentley Woods, Tuddenham Fen, Finborough Park, Needham Market; and at Chippenham Fen in Cambridgeshire. The only suggestion concerning its parasitism that we have is invested in a specimen that Mr. W. H. Tuck bred from among spiders' webs in his stable at Tostock House, Suffolk, on 4th June, 1902; with it appeared a species of *Limnerium* and a ♂ of *Doryctes spathiiformis*, which is known to prey upon the Death Watch, *Anobium domesticum*; but the *Bassus* is hardly likely to have subsisted upon an Arachnid or Coleopterous diet,

2. *bizonarius*, Grav.

Bassus bizonarius, Gr. I. E. iii. 350, ♂; Brisch. Schr. Phys. Ges. Königl. 1871, p. 104; Schr. Nat. Ges. Danz. 1878, p. 111, ♂ ♀. (?) *B. frontalis*, Brisch. l. c. p. 113, ♂. *B. cingulatus*, Holmgr. Sv. Ak. Handl. 1855, p. 369, ♂. *Homoporus bizonarius*, Thoms. O. E. xiv. 1493; Morl. Trans. Ent. Soc. 1905, p. 426, ♂ ♀.

Head fully as broad as thorax; mouth, clypeus, inner orbits and often a facial mark stramineous; frons smooth and canaliculate, clypeus deplanate and apically hardly emarginate. Antennae somewhat longer than half the body, testaceous beneath, with the scape of ♂ stramineous beneath. Mesonotum usually with small hamate marks before and below

* Marshall's specimens were usually carded, which circumstance led him to describe a species of *Euceros* under the name *Bassus peronatus* (E. M. xii, p. 194); but this is not the case with his *Bassus remotus* (Ent. Rec. viii. 1896, p. 296), which is a Plectiscid with acute mandibles; both types are in Mus. Brit. With them are two females of the present species, misnamed and wrongly introduced as British by him, as *Cteniscus cingulatus*, Holmgr.; they are from Ben Nevis.

the concolorous tegulae, flavous; metathorax rugose with the areola distinctly delineated. Scutellum and rarely postscutellum stramineous. Abdomen with the three basal segments scabriculous and the second to third or fourth entirely, partly or usually apically testaceous-red; basal segment subquadrate and basally glabrous, second with (form typ.) or without (var. *cingulatus*) a transverse impression, and, like the third, apically glabrous. Legs testaceous; coxae black with the anterior apically, and all the trochanters, flavescent; all the femora basally and the hind tarsi, together with extreme base and apex of their tibiae, infusate. Length, 4—5 mm.

This species superficially strongly resembles *Bassus multicolor* in its colouration, its sometimes more or less distinctly transimpressed second segment, entirely white scutellum and usually brightly cinctured abdomen; the colouration of the hind tibiae, which are not at all white, readily distinguishes it from that genus, however. The ♂ is also very like *H. obscuripes*, though distinctly stouter with the abdomen broader, the antennae beneath and scutellum pale, and the legs far less nigrescent. The second recurrent nervure is rarely entirely wanting.

It is undoubtedly an uncommon species with us and has a limited distribution in Sweden, France and Germany, whence Gravenhorst gives us the only inkling we have respecting its economy when he says that it has been taken near Helmstadt in August, among plants covered with *Aphides*. So uncommon is it that Bridgman erroneously recorded it as new to Britain (Trans. Ent. Soc. 1886, p. 364), at which time we may suppose he had been working Ichneumonidae for ten years, on the strength of a male taken at Peckham in May; it is, however, mentioned by Desvignes (Cat. 91) as contained in his British collection in 1856. It is not found in May, but is apparently commonest during the first half of June, and subsequently only from the end of July to that of August. Greenings in August (Wilson Saunders), Guildford in August (Butler), Shere (Capron), Felden in Herts (Piffard), Buckenham Ferry, Norfolk, in August (Bridgman), Botusfleming in Cornwall, Bugbrook in Northants and St. Albans (Marshall), Bickleigh, Plym Bridge and Yelverton, all in August (Bignell). It has occurred to me sparingly by sweeping reeds and grasses in very marshy spots in June at Eaton near Norwich, Wicken Fen in Cambs., Gosfield in Essex, and later in the year on *Angelica* flowers at Tuddenham Fen, Claydon bridge, Barnby Broad and the Henstead marshes, in Suffolk.

3. obscuripes, Holmgr.

B. obscuripes, Holmgr. Sv. Ak. Handl. 1855, p. 369, ♂ ♀. *B. rufocinctus*, Desv. Trans. Ent. Soc. 1862, p. 215, ♂ ♀. *Homoporus graculus*, Morl. l. c. 1905, p. 426; Thoms. O. E. xiv. 1494, ♂ ♀ (nec Grav.).

Closely punctate, hardly shining and not very stout, with scutellum entirely black. Mouth and inner orbits always, clypeus and in ♂ a facial mark rarely, flavous. Mesonotum distinctly punctate, usually with a line, often preceded by a notaulal dot, before the stramineous tegulae and sometimes a mark below them, flavous; metathorax rugulose with the areola small, quadrate, entire and not very distinct. Scutellum immaculate. Abdomen with the three basal segments scabriculously, the fourth distinctly, punctate; segments two to four or five apically testaceous, dull red or obsoletely badious; anus of ♀ sub-compressed. Legs nigrescent

with the trochanters and anterior femora internally testaceous, all the tibiae and front tarsi dull red. Length, 4—5½ mm.

Rendered very distinct by its deeply impressed notauli, black femora and scutellum, and by its slender and dull body.

Like the preceding, there appear to be two broods of this species, and it is not at all surprising that this should be so when we consider that Bignell has proved, under *B. laetatorius*, *ante*, that these insects spend the winter in their quiescent state in the body of their host. Naturally these may be expected to emerge with the first genial warmth of spring, unless retarded by the instinct that the Syrphid larvae must have attained a certain size before becoming fit hosts for their progeny. This at once explains the emergence of some species not taking place before June, but hardly that of others, like the present, being abroad so much earlier; the later brood or broods come from the full-fed Syrphid larvae of their present year.

This species is by no means rare with us, though for long little understood and called *B. graculus*, Grav., which title Pfankuch has disproved. It is found somewhat frequently in marshy places throughout the last half of May, I have rarely taken it in June, and but once in July; it is commonest in August, but does not extend into September. Its distribution appears restricted to Silesia, France, and Sweden; and we have no intimation yet of its economy. It has occurred at Lands End to Marquand, at Botusfleming in Cornwall, Nunton in Wilts, and Bishops Teignton to Marshall, Earham and Buckenham Ferry in the Norfolk Broads to Bridgman, Bickleigh, Bovisand and Maker in Devon to Bignell, Redland in May to Charbonnier, the New Forest in June to Brunetti, Worksop to Houghton, Hastings to Rev. E. N. Bloomfield, Shere commonly to Capron, Botusfleming in Cornwall to Marshall, Chatham to de la Garde, and at St. Kilda a ♂ was captured by Waterston in June, 1905 (Ann. Scot. Nat. Hist. 1906, p. 151). It is certainly rare about Ipswich, where I have only taken it at Foxhall, when collecting with the late Arthur Chitty in May, 1907, and on *Heracleum* flower at Barham Oak Wood, when collecting with the late Edward Sparke in July, 1899; but in the north-west of Suffolk, among the Broads, it is common on *Angelica* flowers in August, and on reeds in May at Oulton, Barnby, Henstead, Beccles, and Tuddenham Fen.

4. *pectoratorius*, Grav.

Bassus pectoratorius, Gr. I. E. iii. 333; Ratz. Ichn. d. Forst. iii. 116; Holmgr. Sv. Ak. Handl. 1855, p. 357; Voll. Pinac. pl. i, fig. 7, ♂ ♀. *Homoporus pectoratorius*, Thoms. O. E. xiv. 1496; Morl. Trans. Ent. Soc. 1905, p. 426, ♂ ♀.

Black with the thorax and scutellum red. Head as broad as thorax; mouth, clypeus, in ♀ the facial orbits, and in ♂ whole face and under side of antennae, flavous. Thorax stout and gibbous; mesonotum with the exception of a central apical mark, or only two basal dots, bright red; lines before, and often beneath, the concolorous tegulae flavous; pleurae and sternum red; metathorax dull and subscabriculous, with the areola obsolete but the petiolar area somewhat distinctly defined. Scutellum subconvex, red with its apex usually narrowly flavescent. Abdomen black and deplanate with apices of the segments sometimes very narrowly glaucous-white; basal segment with no discal carinae, of ♀ subquadrate,

of ♂ longer than broad; second sometimes more or less distinctly transimpressed; anus of ♀ slightly compressed. Legs fulvescent and in ♂ paler; hind tarsi and apices of their tibiae nigrescent; trochanters and the hind tibiae, except at their apices, white. Length, $5\frac{1}{2}$ —8 mm.

Instantly known from all other Bassides by the colouration of the thorax and the scutellum.

This is certainly an uncommon species with us though Dr. Capron used to find it plentifully about Shere in Surrey, twenty-five years ago, and there is a long series in his collection. It would appear commoner on the Continent, where it ranges through Belgium, Sweden, Silesia, Austria and France; M. de Gaulle records it (Cat.) as having been bred from both the geometrid moth, *Larentia berberata* and the sawfly, *Trichiocampus viminalis*; but I consider Hern. Tischbein found the more correct host when, as stated by Ratzeburg (*l.c.*), he bred it from the larvae of a *Syrphus* fly, which was probably *S. balteatus*; and Dours (Cat. 56) also tells us it has been bred "de divers *Syrphus*." It is probable that Bridgman misunderstood this species, for neither he nor Bignell mention it in the very full lists of their respective districts, though Haliday's diary, in Dublin Museum, records it commonly from Ireland. It is only recorded from the Isle of Man, on Francis Walker's authority by Marshall (Entom. 1872-3, p. 432) who took it himself at Lastingham in Yorks, Cornworthy and Bishops Teignton in Devon; and from Hastings by Rev. E. N. Bloomfield. Wilson Saunders found it in Surrey; I have beaten it from birch bushes in the Assington Thicks in Suffolk, on 17th May, 1901, and Tuddenham Fen on 21st June, 1909; and a dead female was found in a garden greenhouse at Ryde, in the Isle of Wight, on 17th August, 1903.

5. caudatus, Thoms.

Homoporus caudatus, Thoms. O. E. xiv. 1499; Morl. Trans. Ent. Soc. 1905, p. 426, ♂ ♀.

A fragile, black and shining species with pale legs. Head fully as broad as thorax, strongly transverse; frons smooth and centrally sulcate; clypeus convex and, with the palpi, alone flavous; mandibles ferrugineous, face immaculate black and centrally elevated. Antennae much shorter than the expanded wings, flavescent beneath. Thorax closely punctate with only a minute flavous dot before the stramineous tegulae; metathorax rugose with very indistinct traces of central areae. Scutellum immaculate black. Abdomen entirely black above with the two basal segments subquadrate and subscabriculous to the distinct transverse impression at the apical third of the latter, whence the abdomen to the strongly deplanate anus is punctate and very strongly nitidulous; ventral plica on the three basal segments testaceous; terebra slightly exerted. Legs slender and fulvous with only the coxae and hind tarsi nigrescent, the trochanters and calcaria stramineous. Length, $4\frac{1}{2}$ mm.

The male is said to differ in having the face and mouth pale testaceous, epistoma sometimes black, antennae stramineous beneath, segments three and four fasciated, and the second margined with white-testaceous, anterior coxae entirely, the hind ones apically, and all the trochanters stramineous, anterior femora and tibiae pale, and the hind tarsi subinfusate above. Length, 3 mm.

Thomson described this species from Sweden and France in 1890, since which time I am only aware of my own record of a single female, described above, captured by Dr. Capron at Shere in Surrey some years ago, and this still remains the only known British example of that sex, though Mr. Philip de la Garde has given me a male, captured by him at Devonport during May, 1895.

6. *punctiventris*, Thoms.

Homoporus punctiventris, Thoms. O. E. xiv. 1500; Morl. Trans. Ent. Soc. 1905, p. 426, ♀.

A black species with the femora and tibiae red, the anterior coxae flavous-white, their base together with the hind coxae and trochanters black, the mouth pale and the epistoma whitish testaceous; the abdomen very densely punctate and strongly compressed. Length, 4—5 mm.

This female is similar to *H. caudatus* in its immaculate mesonotum and scutellum, elongate abdomen and red femora and tibiae, but differs in the head constricted behind the eyes, frons finely punctulate, epistoma flavous-white, clypeus black and deplanate and apically subemarginate, mandibles pale, antennae longer, notauli wanting, metathorax shining, finely and not rugosely punctate with the petiolar area well determinate and the costulae indicated; abdomen with segments two to seven equally densely punctate and pubescent; anterior coxae, except basally, and trochanters flavous-white, and the hind tarsi hardly infusate.

I brought this species forward as British (*l.c.*) on the strength of two females taken at Felden, near Boxmoor, in Herts, by Mr. Albert Piffard, and at Cornworthy, near Totnes, in Devon, by Rev. T. A. Marshall, both of which are in my collection. It was originally described from an example captured at Strandmøllen, in Denmark, by Drewsen.

7. *biguttatus*, Grav.

Bassus biguttatus, Gr. I. E. iii. 332; Brisch. Schr. Ges. König. 1871, p. 104; Schr. Nat. Ges. Danz. 1878, p. 112, ♂; Voll. Pinac. pl. i, fig. 8, ♀; Holmgr. Sv. Ak. Handl. 1855, p. 358, ♂ ♀. *Homoporus biguttatus*, Thoms. O. E. xiv. 1500; Morl. Trans. Ent. Soc. 1905, p. 432, ♂ ♀. Var. *Bassus rufipes*, Gr. I. E. iii. 337; Holmgr. Sv. Ak. Handl. 1855, p. 360, ♀. Var. *B. deplanatus*, Gr. I. E. iii. 340; Holmgr. Sv. Ak. Handl. 1855, p. 362, excl. ♂; *B. confusus*, Woldst. Bidr. Kaenn. Finl. 1873, p. 84, ♀.

Head strongly contracted posteriorly, with vertex subangularly emarginate centrally and frons broadly excavate; epistoma large and subconvex, cheeks broader than base of mandibles; clypeus apically broadly rounded; frontal orbits of ♀ immaculate black, ♂ with face and cheeks stramineous. Antennae extending beyond apex of thorax, and apically subattenuate; flagellum of ♂ pale beneath. Thorax alutaceously punctate, with no notauli; ♂ with mesosternum apically, and broadly above intermediate coxae, stramineous; metathorax densely and finely, but not rugosely, punctate with no areae. Scutellum apically white on either side. Abdomen not double length of thorax, apically obtuse; first segment short with often obsolete basal carinae, the second transverse and finely alutaceo-punctate, sometimes obliquely striolate between the thyridii; third of ♂ basally at the sides, and the following fasciated with, white; third and following gradually more finely alutaceous. Legs red

with hind tarsi, and except their white base, tibiae black; ♂ with anterior coxae basally and hind ones nearly entirely black, as well as the tibiae internally dull white. Wings hyaline with stigma dark testaceous. Length, 4—5 mm.

This species may be known by its broad head, excavate but not sulcate frons; black, dull and apically subincised clypeus; broad cheeks, apically explanate face, elongate calcaria, black hind tibiae and tarsi, of which the former are basally white.

It is a very variable species in colour; Thomson tabulates five ♀ and one ♂ varieties:—the former sometimes has (1) the scutellum and post-scutellum apically white throughout (*B. deplanatus*), coupled with either (2) a castaneous mark on either side at base of the second and third segments; or (3) the epistoma centrally white, sometimes together with (4) humeral whitish mesonotal marks and the anterior coxae basally, the hind ones nearly entirely, black; or (5) the hind femora apically black (*B. rufipes*); the ♂ sometimes has the anterior coxae whitish and the hind ones red, apically black (var. 1, Holmgr.).

Gravenhorst knew but a single male taken, together with his single female (type) of the var. *deplanatus*, at bramble on October 1st; Brischke also found it in Germany; in Sweden, Holmgren leads one to suppose that neither is rare, but that the var. *rufipes* outnumbered the typical form in frequency; and the latter is recorded as parasitic upon various species of *Styrphus* by Dours in France, though pointedly omitted from de Gaulle's Cat. Hym. France of 1908. In Britain the only records I can find are Marquand's from the Lands End and Bignell's from south Devon, where he captured it at Laira on 10th July, and Bickleigh on 21st August; Bridgman did not find it in Norfolk, but there is a male in Marshall's collection from St. Albans. I consider it distinctly uncommon in Britain, have never taken it myself, and possess only a few examples of both sexes, captured by Piffard at Felden in Herts, and the late Dr. Capron at Shere in Surrey. In Marshall's collection (Mus. Brit.) are three females of the var. *rufipes*, one with the metathorax dull rufescent, inclining to the next species, from Cornworthy in Devon. Haliday tells us, in his MS. diary in the Dublin Museum, that he found this species commonly in Ireland.

8. *abdominator*, Bridg.

Bassus abdominator, Bridg. Trans. Ent. Soc. 1886, p. 365, ♀. *Homoporus abdominator*, Thoms. O. E. xiv. 1502; Morl. Trans. Ent. Soc. 1905, p. 427, ♀.

A black species with peculiar red markings. Head dull and finely punctate; black with mouth, a small epistomal spot and most of mandibles flavous; clypeus discreted, apically rounded and centrally subemarginate. Antennae about two-thirds the length of the body. Metathorax transverse with a large dull spot on either side, its apical angles prominent and no trace of areola. Scutellum apically flavous-lined. Abdomen longer than thorax; basal segment "dull red with a black central blotch," dull scabrous with obsolete aciculation, "about one and a half times longer than broad," with its apical half subconstricted; remaining segments transverse and somewhat dull with the apical compressed; second concolorous, scabrous with distinct thyridii, and centrally striolate basally. Legs red with hind tarsi and apices of front coxae black; trochanters and base of coxae flavous; hind tibiae black, with the "extreme base whitish merging through dull red into the black." Wings with no areolet, and

the nervellus intercepted below centre; radix and tegulae flavous; stigma dark testaceous, basally pale. Length, 6 mm. ♀ only.

It is said to agree with *H. biguttatus* in every way but its coloration: the metathorax apically and abdomen basally are rosy, and the hind tibiae nigrescent becoming basally whitish through gradual rufescence.

The type was captured by Bignell at Dousland, in Devon, on 23rd August, 1884; it is now in the Plymouth Museum. A second ♀ has been captured by Kriechbaumer in Bavaria. Both were examined by Thomson and considered to constitute a good species by him.

9. *flavolineatus*, Grav.

Bassus flavolineatus, Gr. I. E. iii. 337; Holmgr. Sv. Ak. Handl. 1855, p. 358; Brisch. Schr. Nat. Ges. Danz. 1878, p. 112, ♀ (*nec Zett.*). *Homoporus flavolineatus*, Thoms. O.E. xiv. 1502; Morl. Trans. Ent. Soc. 1905, p. 427, ♂ ♀. Var. *Bassus interruptus*, Holmgr. Sv. Ak. Handl. 1855, p. 359, ♂. Var. *B. bimaculatus*, Holmgr. *lib. cit.* p. 360; Brisch. Schr. Nat. Ges. Danz. 1878, p. 112, ♂.

A black species with the epistoma or in ♂ whole face and mouth, humeral lines and scutellum apically, white; legs red with the hind tibiae and tarsi, except the white base of the former, black; postpetiole quadrate. Length, 5—6 mm.

Very similar to *H. biguttatus*, especially in its hardly excavate, dull and not sulcate frons, the pedal colouration and apically white scutellum; but differing in the narrower head, hardly angularly emarginate vertex, always white female epistoma, nearly always pale humeral lines, apically subdiluted face, longer basal segment with more distinct basal carinae, quadrate postpetiole, stouter hind tarsi, white callosity beneath hind wings and antennae longer than body.

It sometimes varies in having: (1) the mesonotum immaculate black, (2) the mandibles centrally pale, (3) the ♂ scutellum quadrately at apex, and laterally nearly to base, white; (4) ♂ legs mainly flavo-testaceous, (5) ♂ pronotum and mesosternum mainly pale testaceous (var. *bimaculatus*), (6) ♂ third segment broadly fasciated, except centrally, with white and the fourth with a slender concolorous basal line (var. *interruptus*).

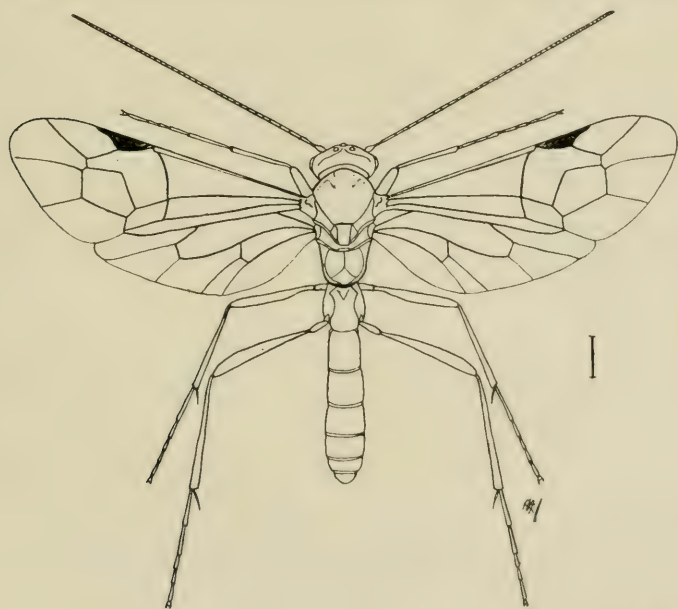
Gravenhorst knew but a single specimen, sent him by Hope from Netley in Shropshire; but it has since been recorded, though of little frequency, from southern Sweden, Norway, Prussia, Belgium, and most probably France, since it figures in Dours' Catalogue though not Gaulle's. The only localised British records are Cameron's "bred from the pupa of a *Syrphus* got on the banks of the Kelvin" (E.M.M. xii (1876), p. 228) and Bignell's from Whitsand Bay early in May; it seems by no means common and, when found, to occur singly; thus Piffard took a single pair at Felden in Herts during many years, Beaumont took one at Blackheath in July, 1897, and one at Lewisham in June, 1891, and Newbery swept one at Ivybridge in Devon in August, 1905, but Capron appears to have met with females not uncommonly at Shere in Surrey. I swept a ♀ at the Brandon Staunch in June, 1903 and another at the end of September, 1907; a ♂ turned up on reeds in the Southwold salt-marshes in the middle of September with *H. deplanatus*, and another was swept at Depden, the highest point of Suffolk (420 feet) during the same month. I believe Mr. Evans at St. Davids in Fife in the middle of June, 1900, and Mr. Atmore at Kings Lynn, Norfolk, have also taken this species. Marshall possessed several specimens from Cornworthy and Bishops Teignton, in Devon.

10. *tarsatorius*, Panz.

Bassus tarsatorius, Panz. F. G. ix. 102, pl. xix; Gr. I. E. iii. 932, ♀; cf. Tosq. Ann. Soc. Belg. 1890, p. 122. *B. exsultans*, Gr. I. E. iii. 328, excl. var. 3; Ratz. Ichn. d. Forst. i. 122, ♂; Holmgr. Sv. Ak. Handl. 1855, p. 359; Brisch. Schr. Nat. Ges. Danz. 1878, p. 112, ♂ ♀. *B. insignis*, Gr. I. E. iii. 349; Ratz. Ichn. d. Forst. iii. 116; Holmgr. Sv. Ak. Handl. 1855, p. 360; Brisch. Schr. Nat. Ges. Danz. 1878, p. 112, ♀. *B. pulchellus*, Desv. Trans. Ent. Soc. 1862, p. 221, ♂ (nec Holmgr.); *B. Desvignesii*, Marsh. Cat. 83. *Homoporus tarsatorius*, Thoms. O. E. xiv. 1503; Morl. Trans. Ent. Soc. 1905, p. 427, ♂ ♀. Var. *Bassus flavus*, Desv. lib. cit. 1862, p. 219, ♂.

A black species with humeral marks, whole scutellum, epistoma, mouth and the apically excised clypeus, stramineous; legs red, with only the hind tarsi and apices of their tibiae black; intermediate segments apically more or less broadly glaucous-white. Length, $4\frac{1}{2}$ —7 mm.

From all species with neither areolet nor metanotal areae, this is instantly known by its clear red hind tibiae which are not at all white and



have only the apex black, and by its entirely pale scutellum. From the foregoing it differs in its very broadly white-marked scutellum, concolorous and obviously emarginate clypeus, less constricted and evenly emarginate vertex, hardly sulcate frons, laterally parallel-sided face, shorter cheeks and stouter mandibles; broader stigma, apically straight radius and centrally intercepted nervellus; somewhat elongate and not carinate petiole, quadrate postpetiole, hind tibiae red with black apices. The ♂ is similar to the ♀ in colouration, but its coxae and trochanters are testaceous, the hamate mesonotal marks larger, its face, frontal orbits and cheeks are stramineous, antennae pale beneath, mesosternum and pronotum, etc., pale testaceous.

This is the only *Bassus* I know that may or may not possess an areolet; when present it is very small, oblique, consisting of little more than the duplication of the basal vein; only one female of my seventy specimens possesses it; it is the var. *flavus*, Desv. = var. *c. alis areola completa*, Thoms. Van Burgst in 1911 records it from the Hague in September.

Panzer, who thought this species "*similis Basso (Earinus) gloriatorio, ast alius et distinctus*," found it on flowers in German woods. It is an extremely abundant species throughout northern and central Europe, extending eastwards as far as India, whence I have seen it. In Britain it is abroad from May 18th to September 26th, though much scarcer in July than in spring and autumn. The males are frequently met with on umbelliferous flowers, especially those of *Angelica sylvestris*, and the females may often be swept from grass in dry and reeds in marshy places, and I have taken the latter in June flying about bramble blossom in my garden at Monks' Soham*. Ratzeburg says (*loc. cit.*) that *B. exultans* was several times bred by Hrn. Bouché from *Coccinella septempunctata*, Linn., in Prussia (*cf.* Morl. Trans. Ent. Soc. 1907, p. 12) and later he records both *B. exultans* and *B. insignis* from species of *Syrphus*; some doubt must remain regarding the former host, since the habits of both are analogous, and the observation is altogether abnormal. Marshall records both sexes of *B. insignis* from *Depressaria angelicella*, Hübn., an even more improbable host (Ent. Ann. 1874, p. 125), especially as Giraud bred it without doubt from *Syrphus balteatus* (Ann. Soc. France, 1877, p. 408). Moreover, on 13th August, 1907, I observed a female *B. tarsatorius* investigating a plant of *Sonchus oleraceus* in my garden at Monks' Soham; it walked over the stem and appeared most interested in the Aphides, *Siphonophora sonchi*, Linn., which partly covered it, though I could not see that it attacked them in any way and no Syrphid larva was apparent.

11. *fissorius*, Grav.

Bassus fissorius, Gr. I.E. iii. 335; Ratz. Ichn. d. Forst. iii. 116; Kriech. Ent. Nachr. 1877, p. 166, ♀ (*nec* Holmgr. et Brisch.). *B. punctatus*, Bridg. Trans. Ent. Soc. 1887, p. 375, ♀. *Homoporus fissorius*, Thoms. O.E. xiv. 1504; Morl. Trans. Ent. Soc. 1905, p. 427, ♂ ♀.

Black with humeral marks, sides of scutellum determinately, mouth, epistoma or in ♂ whole face and cheeks, and the centrally excised clypeus, stramineous; legs red with hind tarsi and apices only of their tibiae black; ♀ coxae entirely black. Length, $6\frac{1}{2}$ —8 mm.

Known by its robust conformation, entirely black ♀ coxae, hind tibiae with no tinge of white and their apex alone black; and especially by the determinately and conspicuously white sides of the scutellum. It is similar to *H. tarsatorius* in colouration, the not excavate frons, wing nervures and stigma; but it is stouter with the vertex not at all emarginate, clypeus apically more deeply emarginate centrally and laterally reflexed; post-

* Details of localities:—Netley (Gravenhorst), common in Ireland (Haliday MS. in Dublin Museum), Glanvilles Wootton (Dale), Bugbrook in Northants, Cornworthy, Bishops Teignton, Niton in Isle of Wight, Botusfleming, Lastingham in Yorks, and Nunton in Wilts (Marshall), Foxhall in Suffolk (Newbery), Caterham and Co. Down (Champion), Lands End (Marquand), Aldeburgh and Tostock (Tuck), North Berwick and Askrigg (Elliott), Hunstanton (Brunetti), Kings Lynn (Atmore), Lakenham, Heigham and Mousehold, Norfolk (Bridgman), Hastings (Vict. Hist.), Bickleigh and Plym Bridge, Devon (Bignell), Shere (Capron), Worksop (Miss Alderson), Alderney (Luff), Feldein in Herts (Piffard), Reigate (W. Saunders), South Leverton in Notts. (Thornley), Harrogate (Roebuck). I have taken it at Chippenham Fen in Cambs. and at Ryde in Isle of Wight; and in Suffolk at Brandon, Harkstead, Bentley Woods, Tuddenhams Fen, Lowestoft, Reydon, Southwold, Henstead, Monks' Soham, and Finborough.

petiole transverse, thyridii transversely oval and their intermediate space not striolate, and the central segments of the ♀ are immaculate. The ♂ differs in having the face, frontal orbits broadly, cheeks, prosternum and mesosternum to black spots under the radices, flavescens; coxae and trochanters flavescens; third segment with a flavescens basal mark on either side, and fourth often with a centrally interrupted basal fascia, white. The bimaculate ♂ has frequently been mistaken for *H. biguttatus*: it was so named by Stephens.

This species has a very restricted Continental range, being recorded only from Bavaria by Kriechbaumer, Silesia and Franconia by Gravenhorst, and the ♂ was for long unrecognised. This sex is much the rarer in Britain, whence I have seen but a single example, mixed in Capron's collection with *H. biguttatus*. The ♀ occurs singly on the south of the Thames from Kent to Lands End:—Shere, several (Capron), Greenings in Surrey, one (Wilson Saunders), Huntingfield in Kent in May, 1904, one (Morice), Hastings district in 1908, one (Butterfield), New Forest, one (Miss Chawner), Redland near Bristol in July, 1904 and 1907, two (Charbonnier), Maker on 27th August and Crabtree on 2nd September, Devon (Bignell), Lands End (Marquand, in coll. Luff), Govilon and Cornworthy one (Marshall). I possess but two specimens from north of the Thames: one captured by Mr. Albert Piffard at Felden in Herts and one taken by myself on a flower-table of *Angelica sylvestris* at Foxhall, near Ipswich, on 5th September, 1902, which is the sole one I have met with in twelve years' collecting. Haliday claims, in MS. in Dublin Museum, to have found it commonly in Ireland. That Bridgman's species is entirely synonymous there can I think, with Thomson, be no doubt; its strongest claim is the fact that it was taken by Champion at Aviemore, in Scotland.

Nees took *B. fissorius* near Sickershausen among aphides, *Myzus cerasi*, Fab., on June 7th; Ratzeburg (*l.c.*) appears somewhat uncertain concerning the species bred by Bouché from *Syrphus ribesii*, but I possess a ♀, carded with the skin of a *Syrphus puparium* (probably that of *S. ribesii*, which it exactly resembles and which I have frequently taken preying upon this aphid), labelled "Emerged July 6th, 1895; bred by C. J. Watkins, at Kings Mill, Painswick, Glos.; in pupa about June 11th, 1895, from *Syrphus* larva found on currant," probably preying on the abundant *Myzus ribis*, Linn.

12. ornatus, Grav.

Bassus deplanatus, Gr. I. E. iii. 340, excl. ♂. *B. ornatus*, Gr. *lib. cit.* 341; Brisch. Schr. Nat. Ges. Danz. 1878, p. 113, ♂. *B. frenator*, Desv. Trans. Ent. Soc. 1862, p. 218, ♂. *Homoporus ornatus*, Thoms. O. E. xiv. 1505; Morl. Trans. Ent. Soc. 1905, p. 427, ♂ ♀. Var. *Bassus deplanatus*, Holmgr. Sv. Ak. Handl. 1855, p. 362, (♂ sic).

A dull and coarsely punctate black species; legs red with the hind tarsi and nearly whole of their tibiae, except the white extreme base, black; scutellum transversely white apically; mouth and clypeus pale, flagellum rufescent beneath; petiolar carinae parallel. Length, 5—7 mm.

At once known by the distinct areolet, rugulose basal segments of the immaculate abdomen, dull black hind tibiae of which the extreme base and inner side basally only are pure white, and by the petiolar carinae extending to apex, from all its allies except *H. deplanatus*. The head is as broad as the thorax, constricted posteriorly; clypeus, mandibles and

mouth pale or in ♂ with the whole face also flavous; antennae quite filiform, with flagellum distinctly rufescent beneath; metathorax subrugose, with basal and petiolar areae more or less distinctly indicated; wings with areolet entire, small and subpetiolate; abdomen deplanate and apically obtuse; basal segment strongly and parallelly bicarinate to apex of the quadrate postpetiole, second transverse and coarsely striolate with distinct thyridii; legs stout and red. The ♂ also has mesonotal humeral markings, a mesosternal lunula, the anterior coxae and ventral plica, pale.

This species occurs throughout northern and central Europe, and I have seen it from the Punjab, in India; Boie was probably in error in giving (Wieg. Archiv. 1836, p. 39) *Noctua chenopodii* as its host, which is far more probably one of the species of *Scaeva* (*Syrphus*), from which it is said to have been raised by Thomson. Sichel was also certainly wrong in synonymising it with *Bassus rufipes*, Grav. (Ann. Soc. France, 1856, Bull. p. 78). In Britain it appears not very uncommon in the late summer—Gravenhorst took it as late as October at bramble—though much rarer in the spring. Bawsey Heath in Norfolk, taken by Atmore (Bridgman); Painswick in Gloster (Watkins); Plumstead and Blackheath in Sept., 1901 (Beaumont); New Forest in September, 1901 (Adams); Lasingham in Yorks (Marshall); Chatham in May, 1892 (Garde); Eriswell in Suffolk, 27th September, 1907 (Elliott). Though most of these localities are well inland, I have personally only found it on the coast, but lacking a knowledge of its hosts the reason is obscure; at Lowestoft at the end of August, 1898, I grubbed it from the root of marram grass on the sand hills; at Southwold one was attracted to artificial light on 1st August, 1900; I found it in a garden at Ryde, in Isle of Wight, in the middle of August, 1902; and it occurred in great numbers on reeds in the salt-marshes at Southwold from 7th to 14th September, 1907.

13. *deplanatus*, Grav.

Bassus deplanatus, Gr. I. E. iii. 340, excl. ♀; Holmgr. Sv. Ak. Handl. 1854, p. 87, ♀; lib. cit. 1855, p. 362, excl. "♂"; Brisch. Schr. Nat. Ges. Danz. 1878, p. 112, ♂ ♀. Var. Bridg. Trans. Ent. Soc. 1887, p. 375, ♂. *Homoporus deplanatus*, Morl. lib. cit. 1905, p. 427; ♂ ♀. *H. nigricornis*, Thoms. O. E. xiv. 1506, ♀.

A dull and coarsely punctate black species; legs red with front coxae, hind tarsi and whole of their tibiae, except the white extreme base, black; scutellum transversely white apically; centre of mandibles and an epistomal line pale; petiolar carinae divergent. Length, 6—7 mm.

This species is so similar to the last that I am not satisfied respecting its specific value; both sexes differ, however, in having the carinae of the first segment basally subdentate, centrally gradually and apically strongly convergent, becoming subconfluent discally; the ♂ differs from that of *H. ornatus* in its immaculate face, antennae rufescent throughout, immaculate sternum, black-marked front coxae and the simply white-banded hind tibiae, the pale marking of which does not extend internally down the leg.

Bridgman's variety has the antennae entirely black (var. *nigricornis*, Thoms.), all the coxae red and the nervellus intercepted nearer its centre; its size is larger, 8 mm. It was captured at Aviemore by Champion.

The only British specimens I can ascribe to this species are three females taken by Dr. Capron at Shere in Surrey, some twenty years ago;

and, possibly, another in the Nottingham Museum, captured at Bagthorpe on 27th May, 1902, by Professor Carr. It is much mixed with the last species in collections and its distribution is probably co-extensive. Giraud bred it (Ann. Soc. France, 1877, p. 408) from a species of *Syrphus* in Austria; and it may be well to here note that his MS. *Bassus pipizae* is said (*loc. cit.*) to have emerged from the allied *Pipiza noctiluca*, Linn.

14. *niger*, Morl.

Homoporus niger, Morl. Trans. Ent. Soc. 1905, p. 422, ♂.

Head as broad as thorax, black with face, mouth except apices of mandibles, frontal orbits and cheeks shortly, stramineous; vertex narrow and not emarginate; clypeus hardly emarginate apically in the centre. Antennae filiform and black above with the scape and pedicellus stramineous, and flagellum ferrugineous, beneath. Thorax with a hamate line before radices and dots beneath both pairs of wings, as well as before the anterior pair pale, as also is the mesosternum anteriorly; metathorax scabriculous with the lateral costae, the petiolar and subquadrate basal areae entire. Scutellum black. Abdomen subparallel-sided, entirely black; two basal segments coarsely and confluent punctate, with their ventral plica dull testaceous; the first basally bicarinate nearly to its centre and the second basally irregularly striolate; anus nitidulous and not compressed. Legs fulvous; all the coxae and trochanters stramineous, with the hind coxae basally black; hind tarsi not infusate. Wings with radix stramineous and stigma fulvous; areolet sessile, with the outer nervure subobsolete; nervellus subopposite and intercepted below its centre. Length, 5 mm.

This species is certainly allied to the French *H. brevicornis*, Thoms., and it is just possible that it is its unknown male, though differing in the short petiolar carinae, posteriorly entire vertex, entirely pale stigma, substriate second segment and the colouration of the legs. At first I had thought it possibly the unknown male of *H. longipes*, Holmgr., to which the colour of the legs is more nearly allied, but the comparatively short antennae, entirely black abdomen and fulvous hind tarsi, seem to preclude such a situation.

I swept the type of this species, which is in my collection and the only specimen known, from rank herbage in Wroxham Broad, Norfolk, during the evening of June 14th, 1901.

15. *Sundevalli*, Holmgr.

Bassus Sundevalli, Holmgr. Sv. Ak. Handl. 1855, p. 364, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 113, ♀. *B. scabrosus*, Desv. Trans. Ent. Soc. 1862, p. 217, ♂. *Homoporus Sundevalli*, Morl. *lib. cit.* 1905, p. 427; Thoms. O.E. xiv. 1508, ♂ ♀.

A black, punctulate and somewhat shining species. Head transverse and hardly as broad as the thorax; mouth, the apically emarginate clypeus, central ♀ epistomal dot or ♂ whole face, flavous; frons subsulcate, immaculate, shining and sparsely punctulate; vertex evenly and somewhat strongly emarginate; face subdeplanate and laterally parallel. Antennae setaceous and longer than half the body, beneath flavous in ♂ and, except scape, rufescent in ♀; basal flagellar joints of ♂ subelongate.

Thorax gibbous, stout and punctulate; hamate lines before and sometimes also beneath radices, and in ♂ base of pleurae lined with, flavous; metathorax rugose with the lateral costae determinate, the basal and petiolar areae indicated. Scutellum, and usually apex of postscutellum, flavous in both sexes. Abdomen longer than head and thorax, deeply punctate, deplanate, black, apically nitidulous and in ♀ subcompressed; first segment parallel-sided, basally depressed and punctate-rugulose with the postpetiole longer than broad, discal carinae parallel, somewhat conspicuous and (*sec* Desv.) confluent before apex; second not transverse with the thyridii oblique, deeply impressed and the intervening space strongly strigose (Holmgr.; *haud striolata*, Thoms.). Legs normal, rufescent with hind tarsi and apices of their tibiae black; coxae and trochanters of ♀ partly nigrescent, of ♂ entirely flavous. Wings slightly infumate; tegulae and radices flavous; costa and stigma black, with base of the latter pale; areolet triangular, petiolate (Desv.) subpetiolate (Holmgr.) or subsessile (Thoms.); radial nervure apically nearly straight; nervellus antefurcal and intercepted a little below its centre. Length, 8—9 mm.

This species is the largest of all *Bassi* (*sensu lato*) and it is at once known by its distinct areolet, entirely pale scutellum and scabrous basal segments. Desvignes adds that his ♂ has the margins of all the segments, and especially the basal ones, tuberculate with three longitudinal furrows on the second; the hind coxae and base of their trochanters black; the frontal orbits partly, and the cheeks, the mesosternum apically, propleural spots and the frenum, flavous. Brischke says his ♀ has the base of the scutellum black and the hind tibiae mainly flavous, though the latter are expressly stated to be pale fulvous by Desvignes; I am inclined to doubt the synonymy of this female.

I have given a full description of this large species on account of its rarity. Only three or four specimens were taken in central and southern Sweden by Boheman and Dahlbom (Holmgr. and Thoms.); the female in Prussia (Brischke). I have seen the male described by Desvignes in the National Collection, and find it entirely synonymous. The only subsequent mention we have of it as indigenous is Bignell's record from Devon: "Captured at Laira, 10th September" (Trans. Devon. Assoc. 1898, p. 501). I have never met with this species and its economy is quite unknown.

16. *dimidiatus*, Schr.

Ichneumon dimidiatus, Schr. F. B. ii. 293; Gr. I. E. iii, 950, ♂. *B. dimidiatus*, Holmgr. lib. cit. 363, ♂. *B. planus*, Desv. Trans. Ent. Soc. 1862, p. 220, ♂ ♀. *Homoporus pictus*, Thoms. O. E. xiv. 1511, ♂ ♀. *H. dimidiatus*, Morl. Trans. Ent. Soc. 1905, p. 428, ♂ ♀.

Head almost broader than thorax, somewhat constricted posteriorly, vertex somewhat angularly emarginate; frons nitidulous and not sulcate, though impressed above scrobes; face subdilated apically with epistoma hardly elevated, of ♀ sometimes white-marked; ♂ with face and cheeks broadly, and mouth, pale; clypeus deplanate, subpunctate with the apex obviously emarginate centrally and the sides foveolate; cheeks almost longer than base of the often pale mandibles; palpi infusate or whitish. Antennae black throughout in ♀, pale beneath in ♂; their apices subattenuate and flagellum, of about twenty-two joints, reaching beyond

thorax. Thorax black, somewhat shining and very finely punctate; a large subhamate humeral mark white, ♂ also with large pronotal mark, mesosternum apically and pleural lines, concolorous; mesosternum densely and very finely punctate, with speculum not smooth; metathorax finely punctate, apically subrugose with areae wanting and lateral costae subobsolete. Scutellum apically and laterally lined with white, rarely immaculate in ♂. Abdomen black and half as long again as thorax, apically smooth and hardly compressed; first segment short, basally excavate and coarsely punctate, with no carinae, postpetiole transverse, spiracles not prominent; second subtransverse, sparsely punctate, and between the transversely oval thyridii, densely striolate; third in ♂ with a more or less conspicuous pale fascia. Legs somewhat stout and red, with the anterior basally paler in ♂ and sometimes black-marked in ♀; hind tarsi and tibiae black, the latter sparsely setiferous externally and white nearly to their centre internally in ♀, or mainly testaceous in ♂ which also often has an infusate band before, though never at, the base. Wings hyaline, stigma infusate and not broad, basally pale; areolet irregular and sub sessile; nervellus oblique, intercepted far below its centre. Length, 5—6½ mm.

This species may be regarded as the type of a small group of closely allied insects, having in common the scutellum not entirely pale and of normal convexity, areolet distinct, abdomen with no broad rufescent markings, mainly whitish hind tibiae, and no or very obsolete petiolar carinae. The present is distinguished by the pale humeral marks, basally pale hind tibiae and its clypeal structure.

This is a widely distributed insect on the Continent, where Schrank first captured it about Ingolstadt in May, and is very abundant in Britain. Desvignes' ♂, which I have seen in the National Collection, is synonymous; but his ♀, which is not there, would appear to belong to Thomson's var. b, with only basal pale scutellar dots. Common in Norfolk (Bridgman); found commonly in Ireland (Haliday MS. in Dublin Museum); Devonport and Laira, Devon (Bignell); Harrogate in 1867 (Roebuck); Bury St. Edmunds (Tuck); Felden in Herts (Piffard); Botusfleming in Cornwall, Nunton in Wilts, Bishops Teignton, Cornworthy and Lavingham in Yorks (Marshall); Reigate (W. Saunders) and Shere (Capron), in Surrey; Guestling in Sussex (Bloomfield); Bonhill and Crookston in Scotland (Dalglish). In Suffolk it is very common at Foxhall, Tuddenham Fen, Ipswich, Monks' Soham, Blakenham, Wenhams, Henstead, Dodnash, Bentley, Eriswell, Southwold and Covehithe; it is perhaps most frequently taken on the borders of woods, especially on the flowers of *Heracleum sphondylium* and in marshes on those of *Angelica*, and in September I have found it not rare on reeds in salt-marshes by the coast, nor is it uncommon in the gardens of large towns. Elsewhere I have observed it at Peterborough, Ryde in Isle of Wight, Matley Bog and Lyndhurst in the new Forest. My captures range from 27th May to 27th September, and its frequency does not appear to diminish during midsummer, as is the case of most *Bassides*. We know nothing of its economy, though that it preys upon Syrphid larvae is rendered probable by my capture of a female on 28th June, 1903, investigating the green and unopened buds of *Heracleum*, covered with *Aphis hieracii*, Kalt.

17. *pictus*, Grav.

Bassus pictus, Gr. I. E. iii. 336, ♂ ♀ (*nec* Thoms.). *B. pumilus*, Holmgr. Sv. Ak. Handl. 1855, p. 364, ♀. *B. thoracicus*, Desv. Trans. Ent. Soc. 1862, p. 219, ♀. *Homoporus pumilus*, Morl. lib. cit. 1905, p. 428; Thoms. O. E. xiv. 1513, ♂ ♀.

A black species, with pale capital and thoracic markings; legs red, hind tibiae whitish with their apex broadly and extreme base black; ♂ with third segment often obscurely red at its base, and the mesosternum and hind coxae black. Length, 4—5 mm.

Extremely like the last species and probably no more than a small form thereof, having less extensive pale markings which will serve to differentiate it; from *H. longiventris* it may be known by its less elongate abdomen, subtransverse second segment, paler stigma, more broadly black hind tibiae and the immaculate male mesosternum.

I possess a ♂ of this species with a distinct areolet in the left wing, but no trace of one in the right. The type of *B. thoracicus* is not in the British Museum, and the description might, with almost equal propriety be supposed to refer to *H. abdominalator*, were the areolet less definitely instanced.

It is not quite of such common occurrence as the last species, though probably equally widely distributed both here and abroad; it appears much more nearly confined to woods, being usually beaten from the branches of trees and shrubs there; and all my specimens were captured in June, though I possess several taken also in September, but with no intermediate dates. Eaton, near Norwich (Bridgman); Felden in Herts (Piffard); Shere in Surrey (Capron); Bury St. Edmunds (Tuck); Blackheath (Beaumont); Wimbledon (W. Saunders); Bugbrook in Northants (Marshall); and Delamere Forest (Tomlin). I have found it, always singly, at Norton Wood and Calbourne, Isle of Wight; and in Suffolk at Brandon, Barhum Oak Wood, Staverton Thicks and in Tuddenham Fen.

18. *incisus*, Thoms.

Homoporus incisus, Thoms. O. E. xiv. 1511, ♀; Morl. Trans. Ent. Soc. 1905, p. 424, ♂.

A black species with apex of scutellum, mouth and the centrally strongly incised clypeus, stramineous; legs red with the hind tarsi and tibiae black, the latter before their base dull testaceous. ♂ epistoma, clypeus and mouth excepting apices of mandibles, stramineous; orbits and cheeks immaculate; a broad subhamate line before and a callosity beneath the front wings, with the basal margin of the mesopleurae, stramineous; apices of scutellum and postscutellum, with the sides of the former somewhat broadly, flavous; legs pale red with all the coxae and trochanters, and the hind tibiae except at their extreme base and apex, whitish; abdomen immaculate, subparallel-sided and broadest behind the centre. Length, 4—5½ mm.

Extremely closely allied to the preceding and differing almost entirely in the conformation of the clypeus, which is laterally, though not apically, reflexed and much more deeply emarginate in the centre of its apex; Thomson gives the length of the Swedish female as 3½ lines or fully seven millimetres, but the British examples appear to run much smaller.

It appears uncommon with us, but is probably only overlooked; I have half a dozen specimens taken at such diverse localities as Longniddry Links, near Edinburgh, on 25th August, 1898 (Evans); Malvern, Worcestershire (Gorham); Greenings (W. Saunders), and Shere (Capron, the typical males), in Surrey; and Ryde, Isle of Wight, 17th August, 1903 (Morley). Its distribution will probably be greatly extended upon investigation; and I am strongly of opinion that *Bassus frenator*, Desv. (Trans. Ent. Soc. 1862, p. 218), represented by a single headless male in the National Collection, is referable to it, rather than to *H. ornatus*, with which I synonymised it in 1905, despite the discrepancies of his primitive description.

19. *reflexus*, Morl.

Homoporus reflexus, Morl. Trans. Ent. Soc. 1905, p. 423, ♀.

Head dull and black; vertex not broad, posteriorly entire; frons centrally distinctly sulcate; face somewhat broader apically with the epistoma a little convex and quadrately pale in the centre; clypeus testaceous, deplanate, not laterally elevated, but with the apical margin entire and strongly reflexed; palpi and base of the stout mandibles flavescens. Antennae longer than head and thorax, and entirely black. Thorax black with a hamate line and a dot before with a longitudinal callosity beneath the front wings, and the basal margin of the mesopleurae flavous; metathorax evenly scabriculous throughout with minute circular spiracles, and the apex centrally subtrigose between two broad and shallow foveae. Scutellum subdeplanate with the apical margin, together with that of the postscutellum, transversely flavidous. Abdomen elongate-oval, immaculate, finely alutaceous and dull, becoming nitidulous towards the slightly compressed anus; basal segment quadrate, laterally margined, with no carinae; the following transverse with the second obsoletely aciculate at its base; terebra reflexed. Legs red; the hind tibiae becoming gradually nigrescent from centre to apex, their tarsi entirely and the anterior at the apex, black. Wings hyaline, with tegulae white, stigma testaceous; areolet subpetiolate; nervellus a little postfurcal and intercepted only slightly below its centre. Length, $6\frac{1}{2}$ mm. ♂ unknown.

From all the other members of the genus bearing an areolet and no petiolar carinae, the present is very distinct in its apically entire and strongly reflexed clypeus. The alutaceous abdomen, thoracic colouration and general conformation ally it with *H. crassius*, Thoms., from which it is sufficiently distinct in its clypeal and vertical structure, sulcate frons, apically explanate face, the antennae entirely and scutellum laterally immaculate, the interception of the nervellus, acutely margined basal segment, the dull testaceous hind tibiae and abdominal plica.

The type, which is in my collection, was taken by Dr. Capron, probably at Shere in Surrey; I also took it in a greenhouse in a Ryde garden, in Isle of Wight, on 11th August, 1902.

Holmgren describes the hind tibiae of his *Bassus strigator* as rufescent with their apices infusate; it is consequently very distinct from that of Fabricius and Gravenhorst; I know nothing so likely to be synonymous with it as the present species, though he goes no further than to tell us that the clypeus is stramineous and apically subemarginate; Thomson thought it possibly referable to *B. ruficornis*, Holmgr.

20. *crassicus*, Thoms.

Bassus fissorius, Holmgr. Sv. Ak. Handl. 1855, p. 362, ♀ (*nec* Grav.). *Homoporus crassicus*, Thoms. O. E. xiv. 1516; Morl. Trans. Ent. Soc. 1905, p. 428, ♀.

A black species with subhamate humeral marks, sides and apex of scutellum, and the mouth whitish; legs stout and red, basally black-marked; hind tibiae white, with only their apex and tarsi infusate. Length, 6—7 mm. ♂ unknown.

In superficial facies and the colouration of head and thorax this species exactly resembles *H. dimidiatus*, but it is stouter and usually larger, the abdomen is more strongly punctate, the legs thicker with the stout hind tibiae becoming very narrowly nigrescent at their extreme apex only; face parallel-sided; clypeus only slightly emarginate apically in the centre, and not reflexed laterally; cheeks short; speculum partly glabrous, base of mesopleurae white throughout; metathorax subrugosely punctate; abdomen not half as long again as the thorax; postpetiole quadrate; second segment transverse and scabrously punctate, though not striolate, between the circular thyridii.

This female is much mixed with the preceding in collections, and I must own that I doubt its being aught but a large and well-nourished form of Schrank's species. Boheman found it in Sweden and Thomson in the Isle of Oland, off the Swedish coast. With us it is certainly uncommon, though I have twice taken it in Suffolk at the end of August, on flowers of *Angelica sylvestris* in Tuddenham Fen and Finborough Park; and possess others taken at Tostock in Suffolk by Tuck, Harting in Sussex by Beaumont, both in early September, and at Shere in Surrey by the late Dr. Capron.

21. *longiventris*, Thoms.

Bassus pumilus, Holmgr. Sv. Ak. Handl. 1855, p. 364, excl. ♀. *Homoporus longiventris*, Thoms. O. E. xiv. 1514; Morl. Trans. Ent. Soc. 1905, p. 428, ♂ ♀.

A black species, with capital and thoracic pale markings; legs red, hind tibiae whitish with their base hardly and apex not broadly infuscate-ferrugineous; anterior trochanters and coxae stramineous; second segment twice longer than broad. Length, 3—5 mm.

Very like *H. dimidiatus*, but at once recognised by its elongate second abdominal segment, pale ventral plica and narrowly rufescent-marked hind tibiae; face not apically dilated; cheeks short; clypeus apically subemarginate and laterally not reflexed; palpi and mandibles whitish; ♂ flagellum pale testaceous beneath; scutellum sometimes white marked at base or apex; abdomen double length of thorax, sublinear, of ♀ apically narrow and subcompressed; basal segment half as long again as apically broad; second nearly twice longer than broad, basally not striolate between the circular thyridii; ventral plica basally whitish; ♂ with third and fourth segments sometimes basally white; legs slender and red with the anterior coxae and trochanters entirely stramineous; stigma dull testaceous.

This species is described from Sweden; and the only subsequent record of which I am aware is my own introduction of it as British six years ago, on the strength of a male swept in a marshy spot at Brandon, in Suffolk, on July 4th, 1903. Rev. T. A. Marshall possessed a male from Govilon, in Monmouth.

22. strigator, Fab.

Ichneumon strigator, Fab. E. S. ii. 173, ♂. *Pimpla strigator*, Fab. Piez. 117; Grav. Germ. Mag. Ent. 1821, p. 268, ♂. *Bassus strigator*, Gr. I. E. iii. 330, ♂ (nec Holmgr.); cf. Thunb. Bull. Ac. Sc. Petersb. 1822, p. 271 et 1824, p. 337, et Brisch. Schr. Nat. Ges. Danz. 1878, p. 112 et 1891, p. 63. *Homoporus strigator*, Morl. Trans. Ent. Soc. 1905, pp. 428 et 434, ♂.*

"Niger abdomine striga alba, tibiis posticis albis apice nigris. . . . Habitat Halae Saxonum Dom. Hübner" (Fab.). Head with the mouth, face and cheeks flavous. Antennae beneath pale testaceous with the scape flavous. Thorax with a mark or broad line before and a little line below radices, propleurae, mesosternum and base of mesopleurae linearly, flavous. Scutellum either flavous with a black longitudinal line, or black with a stramineous dot on either side (or, var. 1, entirely flavous). Abdomen with the two basal segments scabriculous and the following smoother; third to fourth or fifth with a basal flavous or whitish fascia, that on the third and rarely fourth centrally incised. Legs stramineous or pale fulvous with all the coxae and trochanters flavous, and the hind ones black-marked; hind tibiae whitish with their apices, a mark before their base and their tarsi infusate or ferrugineous. Wings hyaline; stigma and radius piceous; radix and tegulae flavous; areolet sessile and irregularly triangular. Length, 5—6 mm. (Grav.) ♀ unknown.

Gravenhorst says this ♂ is similar to that of *Bassus tarsatorius*, but that it differs in the possession of the areolet; he adds that Germar sent him the (type) individual, which Fabricius had named *Pimpla strigator* in Hübner's collection, and that this differed from the remainder of his own specimens in having the third segment alone basally white.

I must own that there is nothing very distinctive in Gravenhorst's description, yet I possess a male so exactly agreeing with it in every way and so obviously distinct from any species brought forward by Thomson that I venture to here place it.

My male is very like that of *H. tarsatorius* in general facies, but—besides the distinct areolet and scutellar colour, which exactly resembles that of *H. fissorius*—the second segment is longer, coarsely longitudinally strigose with the thyridii obsolete; metathorax rugulose and much narrower above the hind coxae, with the petiolar area centrally striolate and bearing some traces of a basal area; head narrower behind the eyes, with the vertex much less emarginate; face more distinctly punctate, with the epistoma more prominent and cheeks shorter; clypeus similarly excised centrally but acuminate explanate at the sides; antennae shorter and consisting of twenty-one flagellar joints; and the scutellum is very distinctly more convex and coarsely punctate. The areolet and sculpture will also distinguish it from *H. fissorius*; and it appears to differ from *H. megaspis*, Thoms., in the sculpture of the metathorax and second segment, and in the hind tibial colouration.

I do not know what species Bridgman understood by this name, he says it is "common" in Norfolk; and Bignell, on the former's authority,

* Dalla Torre (Cat. Hym. iii. 780) has been led into the error of synonymising *Ichneumon strigator*, Fab., correctly placed in *Bassus* by Gravenhorst, with *Tricholabus strigatorius*, Thoms. (the correct synonymy of which I have given at Ichn. Brit. i. 214) through a *lapsus calami* of the latter who ascribes his species (O. E. xix. 2113) to Fabricius, in error for Gravenhorst. The synonymy given by D. T. (l. c. 837) should be transferred to *Tricholabus* above Thomson's name, and the remainder of that at p. 780 placed in the *Bassides*. *B. strigator* is queried as synonymous with his *Homoporus pictus*, Gr. (O. E. xiv. 1512) and *H. ruficornis*, Holmgr. (l. c. 1510) by Thomson.

tells us that in Devonshire he "captured it at Laira, 16th and 23rd September, depositing ova on larva of aphidivorous flies, which were feeding on the wormwood *Aphis, Siphonophora absinthii*." My male was swept from herbage in Henstead marsh in Suffolk on 28th August, 1898. In confirmation of my opinion, I have recently found that the specimen, upon which this species was originally considered British, is in Stephens' collection (in Mus. Brit.), labelled "*strigator*" in his own writing, and that it is most certainly identical with my own, above described. Other specimens have subsequently been mingled with it by Desvignes and Marshall, neither of whom understood it. Haliday mentions it, in his MS. diary now in the Dublin Museum, as being common in Ireland.*

23. *xanthaspis*, Thoms.

Homoporus xanthaspis, Thoms. O. E. xiv. 1518; Morl. Trans. Ent. Soc. 1905, p. 428, ♂ ♀.

A black species with humeral hamate marks, mouth, scutellum entirely and mesosternum partly flavous; legs entirely testaceous or paler, with only hind tarsi darker. Length, 5—6½ mm.

This species is abundantly distinct in its entirely pale scutellum, elongate and deeply punctate second abdominal segment, and strongly compressed ♀ abdomen. It is the last of the *dimidiatus* group of species and differs from my description of that insect in having the face of ♀ black, of ♂ stramineous together with its cheeks and frontal orbits in part; clypeus discally punctulate, apically emarginate centrally, with transverse lateral foveolae, and (like the mouth) stramineous; antennae filiform throughout, of ♀ not reaching beyond the thorax, of ♂ flavous beneath; metathorax rugose-punctate, with petiolar area and lateral costae indicated; scutellum large, convex, densely punctate and entirely flavous in both sexes; abdomen double length of thorax and in ♀ strongly compressed from third segment to anus; postpetiole apically convex in the centre; second segment laterally parallel, longer than apically broad, coarsely and not confluent punctate; thyridii distinct and subcircular, with the intervening space not striolate; third of ♂ with a centrally interrupted basal stramineous fascia; terebra slightly exerted. Legs testaceous or, in ♂, paler; hind tarsi alone subinfusate, and in ♂ their tibiae whitish; wings with stigma basally testaceous; areolet oblique, subseissile and somewhat large.

Thomson described both sexes from examples captured by Drewsen in Denmark; I possess three males from Capron's collection, probably taken at Shere in Surrey, and a fourth which I swept from low herbage in Tud-denham Fen, Suffolk, on 23rd August, 1905.

24. *emarginatus*, sp. n.

Head transverse, not strongly constricted behind the eyes and broader than thorax; mouth, except the castaneous mandibular apices, and apices of the cheeks stramineous; frons, and the laterally impressed face, evenly alutaceous and very dull; clypeus strongly discreted, convex,

* Since the above was written Pfankuch has found that Gravenhorst's ♂ ♂ of *B. strigator* (which he seems to allow are synonymous with Fabricius' species) are co-specific with *B. ruficornis*, Holmgren,

nitidulous and subglabrous with a few deep and scattered punctures, its apex laterally subreflexed, its centre depressed and emarginate. Antennae filiform, slender and longer than half body, piceous with the scape entirely black and underside of flagellum castaneous. Thorax nitidulous, finely and isolatedly punctate with pleurae nearly glabrous, notauli wanting and small circular humeral flavous marks; metanotum shining with obsolete traces of areae; petiolar area strongly carinate throughout and nearly round; spiracles small, circular and black. Scutellum bright flavous with only its base narrowly nigrescent; sulcus simple. Abdomen deep black, double length of head and thorax, strongly and linearly compressed from base of second segment, with obsolete sculpture; basal segment very finely and obsoletely sculptured, nearly thrice longer than apically broad, laterally distinctly margined with its discal sulcus central, not confluent with the apically open basal fovea, and its base subpetiolate; second discally deplanate and shagreened to its centre; remainder discally linear, subcutaneously lacteous and strongly emarginate at their apices; terebra subexserted and acuminate with the valvulae very broad and strongly rounded above; whole anus and venter stramineous-testaceous. Legs short and not stout, fulvous with anterior coxae, trochanters and apices of hind trochanters flavous; hind coxae, base of trochanters and whole femora clear red; hind tibiae and tarsi black with a central basally determinate tibial band, and the calcaria, pure white. Wings hyaline, not large; areolet wanting; stigma castaneous and basally white, radix and tegulae citrinous; nervellus opposite, geniculate but not intercepted slightly below its centre. Length, 6—7 mm. ♀ only.

The hind tibiae are occasionally pale rufescent, not black, with the central band dull white.

I cannot satisfy myself that the upper mandibular tooth is bifid; if this be not the case, the present species must be placed in the subgenus *Saotus* of *Mesoleius*, which certainly more closely resembles the *Bassides*, and that to a remarkable degree, than any other of the *Tryphoninae*; but in all other essentials, except its lack of areolet, *Homocidus emarginatus* is very like *H. xanthaspis*.

The type was captured by Mr. E. A. Elliott, F.Z.S., at Banchory in Kincardine during September, 1910; it has been referred to by him as a probable new species (E. M. M. 1911, p. 93); and is in my collection. I have seen a second female, with the paler legs, from Lastingham in Yorkshire.

25. *elegans*, Grav.

Bassus elegans, Gr. I. E. iii. 313, ♂; Holmgr. Sv. Ak. Handl. 1855, p. 371; Desv. Tr. Ent. Soc. 1862, p. 211, ♂ ♀; cf. Brisch. Schr. Nat. Ges. Danz. 1878, p. 113. *B. nigritarsus*, Gr. I. E. iii. 338, ♀; Holmgr. Sv. Ak. Handl. 1855, p. 365, ♂ ♀. *B. rufonotatus*, Holmgr. lib. cit. p. 369, ♂ ♀; cf. Brisch. Schr. Nat. Ges. Danz. 1891, p. 63, ♀. *B. piceitarsus*, Desv. Trans. Ent. Soc. 1862, p. 217, ♂ ♀. *Homoporus elegans*, Thoms. O. E. xiv. 1520; Morl. Trans. Ent. Soc. 1905, p. 428, ♂ ♀.

Head as broad as thorax and a little narrowed posteriorly; vertex evenly emarginate and not short; frons somewhat shining and apically sulcate; face parallel-sided, cheeks somewhat elongate and not compressed; clypeus white, densely sparsely punctate and apically emarginate; mandibles somewhat stout and subconstricted apically; ♂ with face, most of frontal orbits and mouth stramineous, its cheeks black.

Antennae reaching beyond thorax, black and apically subattenuate; ♂ with scape alone pale beneath. Thorax with mesonotum subnitidulous, densely punctate and bearing lateral elongate sublinear flavous marks; mesosternum laterally closely and coarsely punctate, in ♂ sometimes pale-lined, speculum glittering; metathorax subrugose with the petiolar area apically indicated and lateral costae obsolete. Scutellum black or with, at most, its apex pale. Abdomen hardly half as long again as thorax, usually broadly red centrally, of ♀ elongate-oval and apically subcompressed; the basal segment hardly longer than apically broad, scabriculous with no discal carinae; second scabriculous but not basally striolate between the inconspicuous thyridii, remainder smoother to anus. Legs not slender, red; coxae and trochanters black with the anterior apically in ♀, or mainly in ♂, stramineous; hind tibiae immaculate, their tarsi nigrescent. Wings subhyaline; stigma infusate and basally paler, emitting the radial nervure almost beyond its centre; areolet oblique and subsessile; nervellus a little antefurcal and intercepted below its centre. Length, 4—5½ mm.

The abdominal rufescence is very variable in extent: all the segments may be black (*nigritarsus*), segment three at base and apex only red (*rufonotatus*), segment three entirely with apex of second and base of fourth red (type form), or segments two to four and apex of first red (*elegans*, Desv.); the ♂ rarely has segments two and three red with an infusate central fascia and the fourth basally white, its face too is occasionally black-marked (*pictans*).

The form with black abdomen will at once be recognised from species of the *dimidiatus*-group by its red tibiae and, at most, apically pale scutellum; from its immediate allies this species is easily distinguished by its evenly emarginate vertex, subnitidulous and obviously punctate mesonotum, entirely red femora and tibiae, and the coarse close puncturation of its mesopleurae; the ♂ may further be known by its black flagellum. Dalla Torre follows Marshall in erroneously synonymizing *B. pictans* with *B. obscuripes*, Holmgr.; I have seen Desvignes' types in the British Museum and find they belong here.

This is a widely distributed species throughout Scandinavia, Germany and France (Nantua in Ain and Nantes, Marshall). In Britain it is abundant on flowers from the middle of May to the beginning of October, though nothing is at present known of its economy, for we cannot imagine that either *Bombyx quercus*, which is much too large or *Gracillaria phasianipennella*, which is much too small, are likely hosts for the species of a genus known to be probably exclusively confined in their parasitism to aphidiphagous Diptera (cf. Fitch's record, Entom. 1881, p. 141). Nevertheless, the former host is repeated by Bignell (Tr. Devon. Assoc. 1898, p. 500), who also captured this species at Shaugh Bridge on 15th May, Oreston, Whitsand Bay, Plym Bridge and Bickleigh in Devon. Devonport in May (Garde); Cornworthy (Marshall); Hastings District (Esam); Deal (Sladen); Greenings (W. Saunders) and Shere (Capron), in Surrey; Blackheath, on 2nd October (Beaumont); Felden in Herts (Piffard); Essex (Harwood); Bury St. Edmunds, Bungay and Southwold, in Suffolk (Tuck); Brundall, Eaton and Mousehold, near Norwich (Bridgman); Hunstanton (Brunetti) and West Runton (Wainwright), in Norfolk; Cannock Chase (Tomlin); Cornworthy, Botusfleming, Nunton in Wilts, Lastingham in Yorks, Bishops Teignton, and Bugbrooke in Northants (Marshall). I have found it frequently at Burnham Thorpe, in Norfolk,

and Ryde, in Isle of Wight; and in Suffolk at Monks' Soham, Lowestoft, Brandon, Tuddenham Fen, etc., though not especially attached to damp situations, as one would anticipate from Holmgren's remarks.

26. pallidipes, Grav.

Bassus pallipes, Gr. I. E. iii. 325, ♂ (*sic*); Holmgr. Sv. Ak. Handl. 1855, p. 371, ♀. *Homoborus pallipes*, Thoms. O. E. xiv. 1519; *H. pallidipes*, Morl. Trans. Ent. Soc. 1905, p. 428, ♂ ♀.

A black species, with the vertex angularly emarginate centrally; abdomen centrally and the legs fulvidous-testaceous, with the posterior trochanters basally black; ♂ with hind coxae above and the abdomen, except central fasciae, black. Scutellum broadly pale. Length, 3—4 mm.

This is a small species somewhat resembling *H. pumilus*, but at once known by the colouration of the ♀ abdomen, the ♂ hamate mesonotal marks, apically broadly pale scutellum and fulvescent hind tibiae. It is probably much mixed in collections with the last species, whose scutellar colour is dissimilar, and from which it also differs in having the head broader than thorax and strongly constricted posteriorly; vertex short and angularly emarginate; ♂ cheeks, pronotum and underside of flagellum, also pale; metathorax very finely punctate and not rugose, with areae and costae entirely wanting; scutellum broadly at apex or nearly entirely flavous; central segments more or less broadly red; basal segment twice longer than broad in ♂, postpetiole nearly longer than broad in ♀, and very finely punctate; second segment not transverse nor basally striolate between the small and subcircular thyridii, its disc impunctate but with sparse impressions and, like all the following segments, very finely alutaceous; third and sometimes fourth of ♂ basally stramineous; legs slender with hind tarsi infusate; of ♀ pale red, with base of posterior trochanters black and the hind tibiae apically subinfusate; of ♂ stramineous; with hind coxae and trochanters black above; stigma narrow and stramineous; nervellus intercepted far below its centre.

Thomson says the areolet is occasionally wanting; that the ♀ may have (1) the second and third segments fulvous, with humeral mesonotal marks and apex of scutellum broadly flavous, and mouth whitish; or thus, with (2) the second segment half black at its base and the scutellum bearing a large quadrate mark; or as in the first but with (3) the third segment nearly entirely fulvous. The ♂ varies in having the third and fourth segments basally flavous-white or all the femora with a black basal mark beneath.

To note these peculiarities Thomson must have possessed a good series; but otherwise this species was known by one female taken by Manger in Silesia and two females captured by Boheman in Sweden. Although it was introduced as British by Marshall in 1870, on the strength of a single female in his collection from Cornworthy in Devon, I have seen no indigenous examples, and the only record was published by Bignell (Trans. Devon. Assoc. 1898, p. 501) "Captured at Bickleigh, 4th August and 14th September."

27. *pulcher*, *Holmgr.*

Bassus pulcher, Holm. Sv. Ak. Handl. 1855, p. 370, ♂ ♀. *Homoporus pulcher*, Thoms. O. E. xiv. 1522; Morl. Trans. Ent. Soc. 1905, p. 428, ♂ ♀.

A black species with the mouth, epistoma and humeral marks whitish; scutellum more or less broadly at its apex, and the legs, flavous; anterior coxae and trochanters paler, with the anterior coxae of ♀ basally and hind ones entirely black; abdomen centrally fulvous, with the apical segments flavous-margined. Length, 4—5 mm.

A conspicuous and very prettily marked species, known by its broadly pale scutellum, utter lack of areolet (in fact one male in Marshall's collection has even the submarginal nervure obsolete) and the ♂ flagellum bearing no raised lines; from *H. elegans* it differs in the vertex being short and subangularly emarginate; frons neither shining nor sulcate; mouth white; ♂ with cheeks broadly pale; metathorax densely but not rugosely punctate, with areae and costae entirely wanting; scutellum subtriangularly flavescent nearly to its base; postpetiole quadrate, finely and subrugosely punctate; abdomen black with segment three entirely, second except basally, and the first at its apex, red; apices of the apical and in ♂ central segments flavidous; second subtransverse, broader apically, its base not striolate between the distinct and circular thyridii, disc very finely punctate; legs slender and flavous with coxae and trochanters paler; anterior coxae of ♀ basally and hind ones entirely in ♀, internally in ♂, black; hind tarsi dull testaceous; areolet entirely wanting; nervellus intercepted nearly in its centre.

This species would appear to be rare everywhere; it is found in northern and central Sweden (Thomson), in August (Holmgren); in France (de Gaulle); and Jacobs and Tosquinet record it from Belgium (Ann. Soc. Belg. 1890, p. 125). It was recorded from Lakenham, Earlham and Brundall, in Norfolk, by Bridgman (Trans. Norf. Soc. 1894, p. 629), without any note respecting its novelty as British; and there is a male (named "*gracilentus*, Holmgr.") from Bishops Teignton with two females from Bugbrooke in Northants in Marshall's collection. I also possess a couple of males, captured by the late Dr. Capron at Shere in Surrey; but have not met with this species myself.

28. *signatus*, *Grav.*

Bassus signatus, Gr. I. E. iii. 325, ♀; Holmgr. Sv. Ak. Handl. 1854, p. 85; *lib. cit.* 1855, p. 367, ♂ ♀; cf. Brisch. Schr. Nat. Ges. Danz. 1878, p. 113. *Tryphon nigricornis*, Zett. I. L. i. 399, ♀. *Homoporus signatus*, Thoms. O. E. xiv. 1523; Morl. Trans. Ent. Soc. 1905, p. 429, ♂ ♀.

Head as broad as thorax and a little constricted posteriorly; vertex somewhat short and subangularly emarginate centrally; frons somewhat dull and not sulcate; face laterally parallel; epistoma with a central oblong stramineous mark in ♀, face and frontal orbits nearly entirely pale with cheeks black in ♂; clypeus slightly emarginate centrally with its hardly depressed sides and the palpi pale testaceous; mandibles entirely pale, basally almost shorter than the cheeks and apically constricted. Antennae reaching almost beyond thorax; flagellum ferrugineous in ♀, darker in ♂, with scape and pedicellus black and beneath mainly testaceous. Thorax with large pale testaceous mesonotal humeral

subhamate marks; mesosternum laterally nitidulous and sparsely punctulate below, immaculate in both sexes; metathorax rugose-punctate, dull with the areae indicated. Scutellum immaculate black. Abdomen half as long again as the thorax with the central segments red, and fifth to seventh laterally concolorous beneath; first segment finely scarabrous with short basal carinae; postpetiole quadrate; second slightly transverse and smooth, with its base finely rugulose between the thyridii; third to seventh segments of ♀ becoming gradually more strongly compressed to anus. Legs not very stout, pale fulvous; trochanters and anterior coxae pale testaceous; hind tarsi with claws and unguis somewhat elongate. Wings hyaline; stigma pale testaceous; apical abscissa of radial nervure a little longer than the basal; areolet small and sessile; nervellus intercepted in its centre. Length, 4—5½ mm.

The areolet is rarely wanting and the scape sometimes subimmaculate beneath.

This species is very similar to *Zootrephus* from which the obsolete notauli will at once distinguish both sexes, and its strongly compressed abdomen the female; it may easily be mistaken for *Promethus sulator*, especially in the ♀ abdominal conformation, but the facial sculpture is entirely different.

It occurs from Lapland to Prussia, where it was “aus *Syrphus*-Tönnchen erzogen” by Brischke; and is probably common in Scotland, though I have no records thence. Waterston, however, took several in St. Kilda in July, 1907; and it is reported from Blackburn (Bowdler); Tarrington, in Hereford (Yerbury); Tresswell, in Notts. (Thornley); Lasingham in Yorks and St. Albans (Marshall); Brundall, Eaton and Mousehold, near Norwich (Bridgman); Tostock, in Suffolk (Tuck); Felden, in Herts. (Piffard); and Rossbeigh, in Kerry (Bouskell). To the south of the Thames it appears to be much rarer; I have not seen it in the Isle of Wight, nor Marquand at Lands End; Bignell took one at Longbridge, near Plymouth; Wilson Saunders found it at Wimbledon; Champion at Esher; and Capron only four at Shere in Surrey. I have seen it from the banks of the Humber, in the Hull Museum; as well as at Peterborough, in Northants, and Wroxham and Winterton in the Norfolk Broads. It is very abundant in marshy places, especially on the coast in August and September, though it first appears in the first week of June and also occurs in dryer situations, never on flowers but usually by sweeping low herbage, especially water mint (*Mentha hirsuta*), sometimes long after dark. The strongest evidence I possess for considering it distinct from the next species is that it was abundant at Southwold in September, 1907, when not one of the latter occurred with it. It is abundant throughout Suffolk at Easton and Covehithe Broads on the coast, Henham, Brandon, Freston, Claydon, Monks' Soham, Tuddenham Fen, Herringswell Fen, and Pakenham Fen.

29. *hygrobius*, Thoms.

Bassus festivus, Holmgr. Sv. Ak. Handl. 1854, p. 84; *lib. cit.* 1855, p. 368; Brisch. Schr. Ges. König. 1871, p. 106, ♂ ? (*nec* Fab.). *Homoporus hygrobius*, Thoms. O. E. xiv. 1524; Morl. Trans. Ent. Soc. 1905, p. 429, ♂ ?.

A black species with flagellum ferrugineous, epistoma and mouth and humeral marks pale testaceous, abdomen more or less narrowly in the

centre, and the legs, red; anterior coxae and trochanters citrinous, hind coxae black; areolet wanting or rarely small and sessile. Length, 4—5½ mm.

I very much doubt the specific value of this name, since the areolet may or may not be present in both this and the last species, and the hind coxae seem to vary from entirely red, through entirely subinfusate and partly to wholly black, and that the other distinctions are more constant is, I think, open to doubt. Thomson says (*loc. cit.*) that this species is very like the last but that it has black hind coxae, more finely rugose metathorax and hardly indicated areae, the abdomen is mainly black with the central rufescence narrower, the wings almost always have the areolet wanting and the ♂ usually has a pale mesosternal mark before the intermediate coxae.

Its range may be supposed co-extensive with that of the last species, extending to Nantes (Marshall, *in coll C.M.*). I possess specimens with black coxae and no areolet from Giffnock in Scotland (Dalglish); Cadney (Peacock) and Leamlands (Morley), in Lincs.; Bury St. Edmunds (Tuck); Greenings (W. Saunders) and Shere (Capron), in Surrey; and it has occurred to me in Suffolk at Claydon, Brandon, Pakenham Fen, Depden and Monks' Soham, on the flowers of *Angelica sylvestris*, reeds and low herbage, from May to October, though much more sparingly than *H. signatus*. This is probably the species bred by Brischke in Prussia from some species of *Syrphus*.

ZOOTREPHUS, Thomson.

Thoms. O. E. xiv. 1486; (?) *Zootrephes*, Först. Verh. pr. Rheinl. 1868, p. 162.

Face dull, densely punctate throughout and not distinctly impressed longitudinally. Antennae filiform with the flagellum more or less entirely red; scape excised to its centre. Mesonotum strongly nitidulous, immaculate and subglabrous; notauli deeply impressed; metathorax not unusually short, with its central areae roughly delineated; spiracles small and immaculate. Scutellum black with the basal fovea simple. Abdomen mainly bright red, towards the base dull and finely coriaceous. Legs entirely red, with their base usually black and flavous marked. Areolet wanting; inner cubital nervure regularly curved throughout and not abruptly angled centrally; posterior nervure of fore wing distinctly curved between the basal and first recurrent nervures; nervellus post-furcal and intercepted distinctly below the centre.

This genus is not very distinct superficially, strongly resembling the broadly red-marked *Promethi* and the *Aniarophron*-group of *Homocidus*; but it may be known by its densely and finely coriaceous face which is not nitidulous as in the former, and the very distinct notauli which are wanting in the latter. Sometimes the anus is entirely red, which is the case with no other member of the *Bassides*.

In my former paper (Trans. Ent. Soc. 1905, p. 425) I admitted two species of this genus as British, but after a careful examination of a long series of specimens I am now convinced that we have but one. *Bassus rufiventris*, Grav., is placed in this genus by Thomson and but very imperfectly distinguished from *Holmgreni*, Bridg.; Dalla Torre, following Marshall, has placed it in *Polyblastus*, as the ♀ of Förster's *Tryphon erythrozonius*. Gravenhorst's short description, however, agrees perfectly

with our insect, as far as one is able to judge, with the sole exception of the colour of the anterior coxae; and this is confirmed by Pfankuch, who examined the type in 1910.

1. *rufiventris*, Grav.

Bassus rufiventris, Gr. I. E. iii. 312, ♀; *B. sulcator*, var. 2, Gr. lib. cit. 322, ♂. *Tryphon erythrozonius*, Först. Verb. pr. Rheinl. 1850, p. 283 (?). *Bassus Holmgreni*, Bridg. Trans. Ent. Soc. 1882, p. 161, ♂ ♀. *Zootrephus Holmgreni*, Thoms. O. E. xiv. 1487; Morl. Trans. Ent. Soc. 1905, pp. 425 et 431, ♂ ♀.

Mouth of ♀ alone flavous or also the juxta-antennal orbits concolorous; ♂ with the head anteriorly entirely unicolorous red or with the mouth and face, except sometimes the clypeal foveae and more or less of the margins of the epistoma, flavous. Antennae slightly shorter than the body; red at least beneath throughout, or with the scape entirely black and in ♂ broadly flavous beneath. Thorax gibbous and immaculate. Abdomen a little longer and narrower than head and thorax, deplanate and sublanceolate, or in ♂ nearly parallel-sided; basal segment black, slightly longer than broad, hardly constricted basally and centrally subbicarinat; remainder rarely entirely red, usually more or less narrowly black towards the anus, and in ♂ with the second segment basally black. Legs red with the hind coxae usually broadly black basally, the anterior similarly coloured, entirely red or more usually totally flavous. Length, 4—5½ mm.

Bassus rufiventris, Grav., has now been found to belong to *Zootrephus*, and no doubt can be entertained that Bridgman's species is entirely synonymous with it; he described it as new, doubtless, because Marshall had placed the former in his 1872 Catalogue in a different genus.

This species is recorded from Esher, Brundall and Felthorpe by Bridgman, Bishops Teignton by Marshall, Guestling by Bloomfield, Bickleigh and Princetown in Devon by Bignell; I possess examples captured at Reigate by Wilson Saunders; Shere by Capron; Harting by Beaumont; Bungay by Tuck; as common in Ireland by Haliday (MS. in Dublin Museum); Point of Aire by Tomlin; and several from St. Kilda (*cf.* Ann. Scot. Nat. Hist. 1906, p. 151) by Waterston in June, 1905. It is in my experience local but common where it occurs; thus I have never taken it about Ipswich during fifteen years' collecting, though in the marshes of the Little Ouse in N.W. Suffolk it is found annually in some numbers about Brandon, from 5th June to 25th September, as well as on the banks of the Lark at Mildenhall, Barton Mills and Tuddenham Fen, in the same district; the sexes are found in equal frequency upon long grass and reeds in only the wettest and most boggy spots, invariably by sweeping, though my single ♂ from Holbon Marsh, near Beccles, may have been taken from *Angelica sylvestris* flower; elsewhere I have seen it only in Wicken Fen, Cambs., and by the Nen at Peterborough in June, 1908. Nothing is yet known of its economy, which is probably related to some paludose Dipteran.

PROMETHUS, *Thomson*.

Thoms. O. E. xiv. (1890), 1475; *Promethes et Liopsis*, Först. Verh. pr. Rheinl. 1868, p. 162.

Head anteriorly subtriangular, with cheeks not short; face strongly nitidulous and quite smooth with epistoma not elevated but with two linear impressions above the clypeus, which is often discally foveolate; mandibles slender and discally convex; vertex narrowed posteriorly; ♂ face always entirely stramineous, orbits of ♀ not pale. Antennal scape not elongate; flagellum subfiliform, of ♂ nearly always with elevated lines. Thorax with notauli more rarely distinct; mesosternum smooth; metathorax areated, with the petiolar area not broad, and spiracles subcontiguous with the lateral costae. Scutellum more often black. Abdomen with ventral plica pale, and the ♀ anus distinctly compressed; basal segment not short, rarely with abbreviated carinae; second with subcircular and not basal thyridii; third with epipleurae inflexed nearly to apex. Legs slender, with the tibial calcaria short and claws somewhat elongate; tibiae not banded with colour. Areolet wanting.

Here again Förster's name *Promethes* is inapplicable on account of its restriction, and more especially so since no one has hitherto succeeded in discovering species that will fall into his *Liopsis*, which is said to be distinguished by having the foveae of the not very broad clypeus no further from each other than from the orbits.

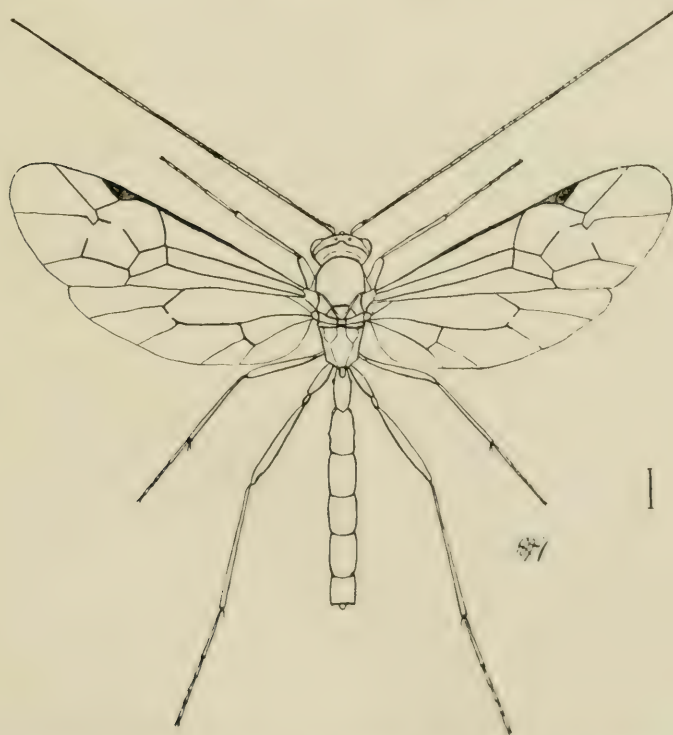
Table of Species.

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|-------|--|-------------------------------|
| (8). | 1. All coxae pale; petiolar area not coarsely sculptured. | |
| (5). | 2. Scutellum black. | |
| (4). | 3. Notauli present; coxae flavous | 1. SULCATOR, <i>Grav.</i> |
| (3). | 4. Notauli wanting; coxae white | 2. ALBICOXIS, <i>Thoms.</i> |
| (2). | 5. Scutellum pale. | |
| (7). | 6. Mesonotum shining; second segment basally strigose | 3. SCUTELLARIS, <i>Bridg.</i> |
| (6). | 7. Mesonotum dull; second segment mainly strigose | 4. DODSI, <i>Morl.</i> |
| (1). | 8. Hind coxae mainly black; petiolar area finely sculptured. | |
| (10). | 9. Basal segment twice longer than broad; coxae white | 5. COGNATUS, <i>Holmgr.</i> |
| (9). | 10. Basal segment not elongate; coxae flavescent. | |
| (12). | 11. Third segment with basal flavous spots | 6. LATICARPUS, <i>Thoms.</i> |
| (11). | 12. Third segment with no flavescent markings. | |
| (14). | 13. Mesonotum dull and confluent punctate | 7. PULCHELLUS, <i>Holmgr.</i> |
| (13). | 14. Mesonotum shining and sparsely punctate. | |
| (16). | 15. Slender; second segment entirely scabrous; vertex normal | 8. DORSALIS, <i>Holmgr.</i> |
| (15). | 16. Stout; second segment apically glabrous; vertex broad | 9. FESTIVUS, <i>Fab.</i> |

1. *sulcator*, Grav.

Bassus sulcator, Gr. I. E. iii. 320, excl. varr. 2—5 et 1, ♂ ♀; cf. Holmgr. Sv. Ak. Handl. 1854, p. 84. *B. festivus*, Zett. I. L. i. 378, ♀ (nec Fab.). *B. areolatus*, Holmgr. Sv. Ak. Handl. 1854, p. 85; *lib. cit.* 1855, p. 365, ♂ ♀; cf. Brisch. Schr. Nat. Ges. Danz. 1878, p. 113, ♀. *Promethus sulcator*, Thoms. O. E. xiv. 1479; Morl. Trans. Ent. Soc. 1905, p. 429, ♂ ♀.

A slender black species. Head as broad as thorax and triangular; cheeks elongate, epistoma of ♀ not pale, frons smooth and centrally sub-sulcate, clypeus unequally foveolate and apically slightly emarginate; ♂ with face, cheeks, and frontal orbits shortly, stramineous; ♀ mouth and clypeus pale. Antennae elongate, slender, filiform, reaching beyond thorax nearly to anus, basally nigrescent or, especially in ♂, pale beneath. Thorax discally shining and nearly smooth throughout, black with no pale humeral marks; notauli indicated, pleurae smooth; basal metanotal area distinct and subquadrate; petiolar area large, subovate and nitidulous. Scutellum black and subconvex. Abdomen black with



segments three, four and apex of second red, fifth rarely concolorous; basal segment aciculate, twice longer than broad, parallel-sided, with spiracles not very prominent; second basally a little constricted and sub-striate between the distinct and subpellucid thyridii; anus of ♀ by no

means strongly compressed. Legs slender and fulvous with all the trochanters and the anterior coxae pale testaceous or, in ♂, flavous; hind tarsi of ♂ subinfusate. Wings with tegulae flavous; stigma pale and apically darker, or in ♂ infusate and basally paler; nervellus opposite and intercepted below its centre. Length, 4—6 mm.

The ♂ abdomen is rarely black-marked centrally.

It is a very abundant species and occurs from Lapland to France and Hungary; I have recently seen it from India. With us it probably is found throughout the British Isles from Lands End to the Orkneys*, though I have no records from Ireland or the west of England. It is on the wing from 27th May to 30th September in Suffolk and is usually captured by casual sweeping, though I have a few times seen it on the flowers of *Angelica sylvestris* and grubbed it from the roots of marram grass on the coast. It is by no means confined to marshy situations, though commoner there. Holmgren once bred it from an undetermined species of *Syrphus* in Sweden, which is the only hint we have respecting its economy.

2. *albicoxis*, Thoms.

Bassus sulcator, var. 5, Gr. I. E. iii. 324, ♂ (?). *Promethus albicoxa*, Thoms. O. E. xiv. 1479; Morl. Trans. Ent. Soc. 1905, p. 429, ♂ ♀.

Black with the centre of abdomen, which has the second segment densely aciculate, and the legs except their white coxae, red; mesonotal notauli wanting; epistoma of ♀ subquadrately pale; ♂ with flavous humeral marks. Length, 5 mm.

Instantly known from the preceding species, with which it was for so long a time intermingled by the white coxae, entirely wanting notauli, and the finely and densely strigose apical half of the second segment. The pale hind coxae and immaculate black scutellum render it distinct from the remainder of this genus.

It has been found in France, Sweden and Germany; and Gravenhorst's extremely probably synonymous single male was taken by Hope at Netley in Shropshire. It is in all likelihood not uncommon with us, though I have rarely met with it, and it was not recognised as British till 1905, though specimens so named in Marshall's collection are from Cornworthy and Botusfleming. The few specimens I possess, however, go to show that its range is extensive: Cannock Chase in June, 1904 (Tomlin); Shere (Capron), Reigate and Cophthorne Common, in Surrey, in August (W. Saunders); Felden, in Herts (Piffard). I swept it from rushes in Hickling Marsh, in the Norfolk Broads, 12th June, 1901; took it from flowers of *Angelica sylvestris* at Spring Vale in Isle of Wight, 16th August, 1903; and found it on the same plant at Henham Park, in Suffolk, 17th September, 1907.

* Details of localities:—Cornwall—Botusfleming and Lands End; Devon—Bickleigh, Bishops Teignton, Cornworthy, Devonport, Plymouth; Hants—Lyndhurst, and Matley Bog; Sussex—Hastings District; Surrey—Shere, Reigate and Greenings; Herts—St. Albans, Felden; Wilts—Nunton; Cambs—Wicken, Burwell and Chippenham Fens; Suffolk—Timworth (Col. Nurse), Aldeburgh, Finborough and Benacre Broad (Tuck); Norfolk—Heigham, Brundall, Eaton, Cromer, W. Ranton, Hunstanton, Buckenham Ferry, Wroxham and Ranworth Broads; Lincs.—Leamlands; common in Ireland (Haliday MS. in Dublin Museum); Scotland—(rockston (Dalglish). In Suffolk I have also found it at Brandon, Barton Mills, Mildenhall, Tuddenham Fen, Monks' Soham, Claydon, Foxhall, Lowestoft denes, Rushford, Southwold, Barnby Broad, Depden, Framlingham, Bungay and Pakenham Fen.

3. *scutellaris*, Bridg.

Bassus scutellaris, Bridg. Trans. Ent. Soc. 1886, p. 364, ♀ (♂ sic). *Promethus scutellaris*, Thoms. O. E. xiv. 1478; Morl. Trans. Ent. Soc. 1905, p. 429, ♂ ♀.

Black with the epistoma of ♀ above and of ♂ entirely, and the scutellum in both sexes entirely, flavous; abdomen broadly rufo-testaceous centrally with the disc more or less broadly nigrescent; legs flavous with their base white. Length, 5 mm.

At once recognised by its pale scutellum, elongate basal segment, only basally strigose second, and the nitidulous mesonotum. The epistoma of ♀ is testaceous below the slender antennae, which are pale beneath; the mouth, as well as the ♂ face and cheeks, are flavous; thorax shining, with notauli hardly indicated and humeral marks entirely wanting; basal metanotal area subtransversely quadrate; abdomen black and in ♀ apically subcompressed, with the third to fifth or sixth segments and apex of the second pale red, all more or less broadly infusate discally; second segment basally constricted and substriate only between the thyridii, remainder of abdomen smooth and nitidulous; legs entirely pale with coxae and trochanters whitish; stigma pale, nervellus subopposite and intercepted almost above its centre.

Bridgman's description is clumsy and makes no mention of the facial sculpture; I had supposed it to belong to the *elegans* group of *Homocidus*, but Thomson examined the type, which was captured by Bignell at Bickleigh, near Plymouth, in Devon, on 3rd June, 1884, and found that Kriechbaumer had taken the male sex in Germany. I have a female and three males, found some twenty years ago at (probably) Shere in Surrey, by the late Dr. Edward Capron; and there is also a male in Rev. T. A. Marshall's collection from Govilon.

4. *Dodsi*, Morl.

Promethus Dodsi, Morl. Trans. Ent. Soc. 1905, pp. 421 et 429, ♀.

"Black; legs, scutellum, postscutellum and centre of abdomen broadly, red; antennae beneath, part of the face and of the mouth, flavous; mesonotum closely and coarsely punctate, dull; antennae as long as the body; clypeus bifoveolate. Length, 6 mm. ♀ only.

This species is so closely allied to *P. scutellaris*, Bridg., as to require no detailed description. Therefrom it differs in its twice longer antennae (which possess twenty-four, not twenty-two, joints), its bifoveate clypeus which is subdentately produced apically in the centre and distinctly impressed transversely before the base; in its dull and coriaceous punctate mesonotum, distinct and discally coalesced notauli, strongly transverse basal area; in the broadly flavous facial orbits, entirely rufescent clypeus, apically black epistoma, the antennae entirely flavidous beneath, darker scutellum and red postscutellum, immaculate trochanters, testaceous stigma; and in having the abdomen and especially its basal segment stouter, with segments three, four, base of the fifth and apex of the second entirely clear red, the last-mentioned being striolate from its base nearly to its apex. In the dull and confluent punctate mesonotum it resembles *P. pulchellus*, from which the entirely pale coxae and scutellum, as also the clypeal structure, at once distinguish it.

Taken by Dr. Capron, probably in Surrey; the type is in my collection.

Uxori mei hoc insectum dicatum volo." I have seen no second example.

5. *cognatus*, *Holmgr.*

Bassus cognatus, Holmgr. Sv. Ak. Handl. 1855, p. 366, ♂ ♀; cf. Brisch. Schr. Nat. Ges. Danz. 1878, p. 113. *Promethus cognatus*, Thoms. O. E. xiv. 1481, ♀; Morl. Trans. Ent. Soc. 1905, ♂ ♀.

Black with the apically strongly compressed abdomen centrally, and the legs, red; hind coxae and trochanters basally black; basal segment elongate. Length, 4—5 mm.

This species is similar to *P. sulcator* and *P. albicoxis* in the elongate petiole, but differs materially in the evenly foveolate and in ♀ black clypeus, small ♀ pale mark below the longer and more slender antennae, shining and immaculate mesonotum, somewhat broad and apically darker stigma, entirely substrigose second abdominal segment, the apical margin of which with the whole of the third and fourth segments are red; the slender red legs with their coxae and trochanters, except the basally black hind ones, stramineous. From *P. pulchellus* it is distinct in its nitidulous and more finely punctate metathorax, the basal segment being twice longer than broad, and in its coxal colouration.

That Holmgren's ♂ is entirely referable to this species is evidenced by the description of the basal segment referring to both sexes, though he adds "coxis posticis in ♂ rarissime basi nigra," which doubtless led Thomson to refer only to the ♀.

It ranges through Germany, Sweden and France; and is by no means an uncommon species in Britain, occurring from 15th May to 22nd September, by sweeping low herbage, only in very marshy places; from the middle of June to towards the end of August, however, I have no records, whence it appears to be regularly double-brooded. Botusfleming, Cornwall and Cornworthy (Marshall); Plymouth and Bickleigh, Devon (Bignell); New Forest, Hants (Morley); Guestling, Sussex (Bloomfield); Reigate (W. Saunders) and Shere (Capron), Surrey; Felden (Piffard); and common in Norfolk (Bridgman), where I have taken it at Cromer, Horning Ferry and Wroxham Broad, as well as in Suffolk at Brandon, Foxhall, Stoke by Clare, Bentley Woods, Southwold, Barnby and Oulton Broads, Barton Mills, Tuddenham Fen and Ousden.

6. *laticarpus*, *Thoms.*

Bassus sulcator, var. 5, Grav., ♂; *B. exultans*, var. 3, Grav., ♂; *B. gracilentus*, Holmgr. Sv. Ak. Handl. 1855, p. 368, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1891, p. 63, ♂ (?). *Promethus laticarpus*, Thoms. O. E. xiv. 1481; Morl. Trans. Ent. Soc. 1905, p. 429, ♂ ♀.

Black with a transverse mesosternal mark, humeral lines and a large ♀ facial mark, flavidous; postpetiole quadrate; second segment apically, third except a citrinous spot on either side at the base, and fourth except a black discal mark, red; legs red with hind coxae basally black and their trochanters citrinous; ♂ with scutellum almost always stramineous and third segment tricoloured. Length, $3\frac{1}{2}$ —5 mm.

Easily recognised by the colouration of the third abdominal segment, the anterior pale mesosternal fascia, the basal segment not twice longer than broad, the ♀ pale marks before radices and the stramineous ♂ scutellum.

The ♀ rarely has a small black mark beneath the femora. The ♂ varies in having (1) the second segment apically brunneous, the third broadly citrinous basally, centrally black and apically red, with the hind femora black-marked beneath; (2) two stramineous mesonotal vittae, sometimes (3) coalesced with the concolorous anteradical lines and the fourth segment also tricoloured; and (4) its scutellum is rarely black.

That *B. gracilentus* is at all synonymous with this species I am by no means persuaded, and should suggest a position nearer *Homocidus signatus*, on account of the facial sculpture. I do not know what Bridgman understood by this name, which he applied to specimens taken by Bignell at Longbridge on 27th June and Bickleigh twice in September, in Devon; but that it was an uncommon species is evidenced by his failing to discover it in Norfolk himself. Francis Walker, too, is said by Rev. T. A. Marshall (Entom. 1872, p. 432) to have found *B. gracilentus* in the Isle of Man in 1869.

P. laticarpus was described from Sweden and I possess an example captured by Marshall at Nantes. In Britain it is very uncommon and appears to occur singly by sweeping low herbage in the most boggy spots. Wilson Saunders took it at Greenings in Surrey in August, 1871; I have turned it up at Matley Bog in the New Forest in the middle of June; in Rockland Broad, Norfolk, in the same month, and at Metton near Cromer at the end of August; in Suffolk it has once occurred at Henstead Marsh, near Lowestoft, on 12th July, 1900, on long grass.

7. *pulchellus*, Holmgr.

Bassus sulcator, varr. 1 ♂, 3 et 4, Grav. I. E. iii. 321. *B. festivus*, varr. 2 et 3, Gr. lib. cit. 316. *B. pulchellus*, Holmgr. Sv. Ak. Handl. 1855, p. 366; Brisch. Schr. Nat. Ges. Danz. 1878, p. 113, ♂ ♀ (nec Desv.). *Promethus pulchellus*, Thoms. O. E. xiv. 1429; Morl. Trans. Ent. Soc. 1905, p. 429, ♂ ♀.

Black with the abdomen centrally, and the legs, red; coxae black with the anterior apically pale; mesonotum somewhat dull and not strongly nitidulous; ♂ mesosternum immaculate black. Length, 4—5 mm.

This species is similar to *P. laticarpus* in its mesonotal sculpture, wings and petiolar conformation; but differs therefrom in having the mesonotum, mesopleurae and scutellum entirely black or at most with only obsolete pale anteradical lines; the ♂ scutellum is not pale. From *P. festivus* it is distinct in its narrower head, duller mesonotum, longer wings and antennae, and less strongly compressed ♀ anus. The black hind coxae, not elongate basal segment, dull and confluent punctate mesonotum, and lack of citrinous colouration upon the abdomen will at once distinguish it from the remainder of this genus.

It has a wide Continental distribution through northern and central Europe; Belgium (Jacobs, Ann. Soc. Belg. 1890, p. 124), France (Gaulle, Cat.), etc.; and I have seen it from as far east as India. In Britain it is a very abundant species everywhere* from 15th May to 19th October, with no diminution of its frequency during midsummer, and is usually found

* Details of Localities:—Netley, Shropshire (Grav.); Lands End (Marquand); common in Norfolk (Bridgman), Winterton, Rockland and Surlingham Broads (Morley); Plymouth, Bickleigh and Plym Bridge, Devon (Bignell); Felden (Piffard); Finborough, Bury and Tostock, Suffolk (Tuck); Nunton in Wilts, Bugbrook in Northants and Cornworthy (Marshall); Gwydir near Trefriw, Wales (Newbery); Greenings (W. Saunders), Caterham (Champion), and Shere (Capron), Surrey. I have found it at Ryde in Isle of Wight, Hastings; and in Suffolk at Claydon, Needham, Monks' Soham, Wherstead, Mildenhall, Brandon, Southwold, Ousden and Depden.

by sweeping low herbage, though occasionally upon the flowers of *Angelica* and at *Polygonum*; on 7th September, 1908, I took three or four females closely investigating *Aphis crataegi* in my garden at Monks' Soham House, but observed no oviposition. We know nothing of its economy; and little doubt can exist that some error had crept into Gravenhorst's record of *Bassus festivus*, var. 2 (*l.c.* 317) "*Neeseo ab Esenbeck feminae prodibant e larvis Curculionis polygoni*," though it is strange that, in ignorance of this, I should have once or twice observed this species on its food-plant.

8. *dorsalis*, Holmgr.

Bassus dorsalis, Holmgr. Sv. Ak. Handl. 1855, p. 367, ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 113, ♂. *B. maculatus*, Desv. Trans. Ent. Soc. 1862, p. 216, ♂ ♀. *Promethus dorsalis*, Morl. lib. cit. 1905, p. 429; Thoms. O. E. xiv. 1485, ♂ ♀.

Black with the legs nearly entirely, and the abdomen except at base and apex, red; the latter strongly and falcately compressed in ♀ from the third segment, with discal black vittae. Length, $4\frac{3}{4}$ — $5\frac{1}{2}$ mm.

This species will be recognised with facility by its triangular face, elongate cheeks, brunneous and not very slender antennae, nearly hyaline wings, the not very short basal segment with its quadrate postpetiole, entirely scabrous second segment, the third or even second to sixth of ♀ falcately compressed laterally, and the slender legs. The ♂ has the frontal orbits shortly, face and cheeks entirely, stramineous. The hind coxae are at least partly black, the basal segment not twice longer than broad, the third not stramineous-marked, the mesonotum is smooth and strongly nitidulous, and the conformation is much more slender than *P. festivus*, with which the compressed abdomen allies it.

The ♀ sometimes has (1) a subquadrate epistomal mark, small humeral lines and the anterior coxae and trochanters, stramineous, with (2) the mesosternum rarely pale-lined on either side; and the ♂ segments are occasionally apically black. I have examined Desvignes' species in the British Museum and find it entirely synonymous.

Though widely distributed in northern Europe through France, Holland, Belgium, Germany and Sweden, this species appears somewhat uncommon; at all events it is so in Britain, where it is only found in the wettest and most boggy situations, always by sweeping reeds. Mousehold, Heigham and Brundall, Norfolk (Bridgman); Maker in August, but apparently rare, in Devon (Bignell); Botusfleming in Cornwall, Nunton in Wilts, Lasingham in Yorks and Cheltenham (Marshall); Shere in Surrey (Capron); one at St. Kilda (Waterston, Ann. Scot. Nat. Hist. 1906, p. 151). I have only found it in June and September at Horsey in the Norfolk Broads; Brandon, Henstead marsh, Foxhall pond, and Easton Broad in Suffolk. I was surprised to sweep an undoubted ♀ of this species from oats on the edge of an upland field at Monks' Soham on 25th July, 1905; but there appears no especial reason for the more usual occurrence of the species of this genus in damp situations, since they are all doubtless Syrphidophagous, unless they be especially attached to hosts preying exclusively upon such aphides as *Rhopalosiphum nymphaeae*, Linn. or *Hyalopterus arundinis*, Fab.

9. *festivus*, *Fab.*

Ichneumon festivus, *Fab.* E. S. Suppl. 230; *I. festinator*, *Thunb.* Bull. Ac. Petersb. 1822, p. 265; *I. c.* 1824, p. 319. *Ophion festinator*, *Fab.* Piez. 140; *Oliv.* Encycl. Méth. viii. 516; *Bassus festinator*, *Gr.* Nov. Act. Curios. 1818, p. 293. *B. festivus*, *Gr.* I. E. iii. 314, excl. varr. 2 et 3; *Ruthe*, *Stett.* Ent. Zeit. 1859, p. 372, ♀; *Brisch.* Schr. Nat. Ges. Danz. 1878, p. 113, ♀; *I. c.* 1891, p. 63, ♂ (*nec* *Zett. et Holmgr.*). *Promethus festivus*, *Thoms.* O. E. xiv. 1484; *Morl.* Trans. Ent. Soc. 1905, p. 429.

Head large, body stout and black with third and apex of second abdominal segments, the femora and tibiae, red; mesonotum nitidulous and in ♀ impunctate; antennae and wings short; anus of ♀ strongly compressed. Length, $4\frac{3}{4}$ — $5\frac{1}{2}$ mm.

The vertex is thick and the head a little broader than the thorax; cheeks wanting, but broadly excavate behind the base of black and centrally pale mandibles; face shining and distinctly punctate; clypeus subdiscreted, black, apically broadly emarginate and laterally subacutely produced; ♂ with the frontal orbits shortly and the face alone pale. Antennae stout and not reaching apex of thorax, black and in ♂ pale beneath. Thorax strongly coarctate and black with a small pale callosity before radix; mesonotum usually nitidulous and subglabrous in ♀, punctate in ♂; metathorax subrugosely punctate, with distinct areae. Scutellum black. Abdomen short, of ♂ subdeplanate, of ♀ very strongly compressed apically from the centre; basal segment short with no carinae; the second not apically scabrous, with its apex and the third entirely red. Legs not very slender, red with coxae and trochanters, except anterior of ♂, black; apices of the hind tibiae and tarsi nigrescent. Wings short and somewhat distinctly clouded; basal nervure vertical and radial cell short; nervellus subopposite and intercepted in its centre. The ♀ sometimes has a small pale epistomal mark; the third segment of ♂ is often black-marked, rarely black with but a rufescent fascia, and its hind femora are occasionally black towards their apices.

It is at once known by the coarctate body, broad vertex which renders the head very conspicuous, shining mesonotum, short wings and antennae, and the compressed ♀ anus.

The distribution extends throughout northern and central Europe and Gravenhorst took it in June, July, August and September on umbelliferous flowers. Its economy is become involved in consequence of its difficult synonymy: Van Vollenhoven states (*Pinac.* 3) that "Heeger in the *Isis* for 1848, p. 986 mentions that out of the caterpillar of *Heliodines roesella*, L. amongst other parasites also came forth *B. festivus*, F."; but Dalla Torre ascribes its breeding from *Elachista roesella* to Rondani, without reference. The latter also refers the raising of this species from the Curculionid beetle, *Phytonomus polygoni* to Brischke, but it appears to me to be nothing by a restatement of Gravenhorst's record (*cf.* *P. pulchellus*, *supra*). Probably the only reliable host is that given by Brischke, in 1878, when he says "*Aus Syrphus-Tönnchen* erzogen." It is not a very common species in Britain, though recorded from Lands End (Marquand); Bickleigh, in August (Bignell); Cringleford, in Norfolk (Bridgman); Reading and Shotover, Oxford, at the end of July (Hamm); Ripple near Dover, and St. Margarets Bay, in Kent in July (Sladen); Bungay, Suffolk (Tuck); and doubtfully from Bishop Wood, in Yorks (Bairstow). Most of my specimens are from Shere and Felden, and I have but thrice taken it in

the course of ten years' collecting; it turned up at Barham on 2nd September, 1896, at the adjacent parish of Coddensham on 14th July, 1899, on flowers of *Heracleum sphondylium* and on 25th of the same month at Peasenhall, also in Suffolk, on those of *Daucus carota*, early in the morning.

PHTHORIMUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 162; Thoms. O. E. xiv. 1474.

Head transverse with the face shining and subglabrous, longitudinally bicarinate. Antennae slender, in ♀ filiform and not longer than head and thorax, longer in ♂. Thorax gibbous; metathorax very short with the metanotum coriaceous, longitudinally and parallelly bicarinate, areola confluent with basal area; spiracles small and immaculate. Scutellum not convex, rarely subobsoletely flavous laterally in the centre, with its basal fovea simple. Abdomen sessile, basally scabrously punctate; of ♂ linear with an impressed line near base of third segment; of ♀ very strongly compressed from the second or third segment; terebra sometimes elongately exerted. Legs not stout, red and sometimes basally black, not white-marked; basal joint of hind tarsi elongate and much more than double length of the longer of the hind calcaria. Areolet present and sometimes externally bifenestrate; basal half of second recurrent nervure pellucid; nervellus subopposite and intercepted distinctly below the centre.

This genus is so closely allied to *Trichomastix* that I am not convinced of its right to a distinct existence; however, the much smaller metathoracic spiracles, less elevated scutellum and simple scutellar fovea appear to be reliable characters, which is, I think, more than can be said of the presence of the areolet, though it will be noticed that the external cubital nervure in this genus curves below the areolet, whereas in *Trichomastix* it is quite straight. The peculiarly compressed abdomen in both these genera will distinguish their females from the former ones. The elongately exerted terebra of one of our species is very remarkable.

Both the known species were first described from Britain.

Table of Species.

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|---|----------------------|
| (2). 1. Areola transverse; temples narrow; abdomen not strongly punctate .. | 1. COMPRESSUS, Desv. |
| (1). 2. Areola elongate; temples broad; abdomen strongly punctate | 2. ANOMALUS, Morl. |

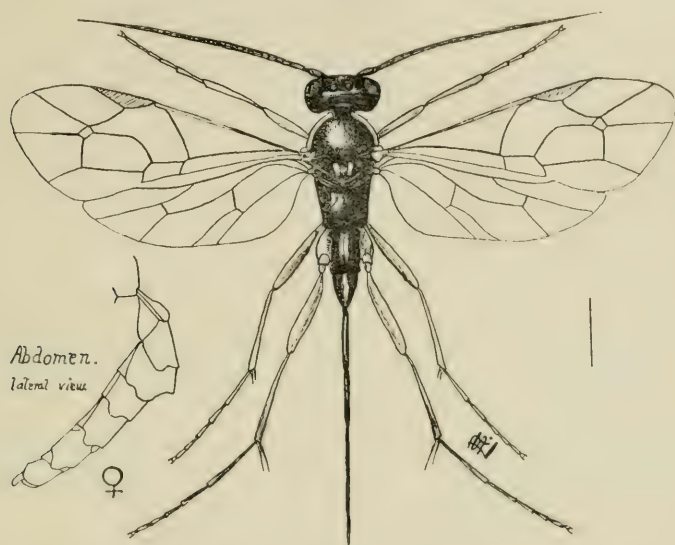
1. compressus, Desv.

Bassus compressus, Desv. Cat. 91, ♀; Trans. Ent. Soc. 1862, p. 220, ♂. *B. ibalioides*, Kriech. Ent. Nachr. 1878, p. 211, ♀. *Phthorimus compressus*, Thoms. O. E. xiv. 1474, ♀; Morl. Trans. Ent. Soc. 1905, p. 430, ♂ ♀.

A somewhat strongly nitidulous black species with only the metathorax and basal, or in ♂ two basal, segments with base of the following one, coriaceous. Head distinctly constricted behind the eyes. Mesonotum finely but distinctly and closely punctate. Mouth, centre of face, a dot before and line below the concolorous tegulae, and in ♂ the whole face,

cheeks, underside of scape, two broad hamate lines on front of mesonotum, a sutural line encircling the breast, and the anterior coxae, flavous. Flagellum of ♂ ferrugineous beneath. Abdomen scabriculous to base of second segment in ♀ and third in ♂, thence glabrous and strongly nitidulous. Legs clear fulvous with only the hind tarsi infuscate and sometimes all the ♀ coxae black; areolet obliquely quadrangular and hardly broader than high. Length, $7\frac{1}{2}$ —(protruded) $9\frac{1}{2}$ mm.

Instantly known from the following species by its hardly exerted terebra.



This species appears almost confined to Britain and is certainly very rare with us. Desvignes tells us nothing of localities in either of his descriptions; the only record is by Marshall (Entom. 1872—3) who says Francis Walker took it in the Isle of Man; and I possess but two females, one of which was captured by the late Alfred Beaumont at Catford on 11th June, 1892, and has the lateral margins of the scutellum centrally flavous. The only individual I have captured was flying along, about a foot from the ground, upon a chalky hillside, just above Boxmoor Station in Herts, while I was staying with Mr. Albert Piffard, on 9th August, 1903. Stenton found a female at Herne Hill at the end of June, 1910. Nothing is at present known respecting its habits.

2. *anomalus*, Morl.

Phthorimus anomalus, Morl. Trans. Ent. Soc. 1905, pp. 420 et 430, ♀.

Head not narrowed posteriorly, entirely black and subglabrous with the strongly pilose maxillary palpi apically white; vertex posteriorly entire; frons nitidulous, shortly pilose, sparsely and obsoletely punctulate, centrally subcarinate with the scrobes large and glabrous; face strongly nitidulous; epistoma somewhat convex and distinctly discreted from the short, broad, apically strongly emarginate clypeus by a straight fossa

which is laterally produced upwards to the orbits; cheeks much shorter than basal width of the stout and laterally margined mandibles. Antennae short, not reaching beyond apex of thorax; black with the pedicellus pale above; flagellum with about 19 joints, ferrugineous beneath with the apices of the joints subnodulose and infusate; apical joint conical and obtuse. Thorax strongly nitidulous, immaculate; mesonotum anteriorly subconvex, evenly and finely punctate, with distinct notauli; mesopleurae sparsely and evenly punctate, basally impressed in the centre; metathorax very strongly and evenly punctate with the petiolar area subobsolete and the spiracles circular; areola glabrous, parallel-sided and twice longer than broad, with lateral costae distinct but costulae wanting; metapleurae sparsely pilose. Scutellum black, hardly convex, nitidulous and obsoletely punctate; postscutellum very small. Abdomen longer than head and thorax, immaculate, very strongly and evenly punctate throughout, with only the apices of the segments glabrous and broadest at the apex of the first; second segment with distinct thyridii; terebra exerted and as long as the abdomen, with spicula flavous and strongly acuminate apically, valvulae black and very strongly setiferous-pilose throughout. Legs clear red with all the coxae and basal joint of trochanters black, with all the apical tarsal joints infusate; hind metatarsi, flavescent and four times longer than their concolorous calcaria; tarsi not longer than the tibiae, of which the hind pair is very slightly intumescent before the flavescent base. Wings hyaline with the stigma luteous, tegulae and base of the costa pale flavous; areolet sessile, twice broader than longer; nervellus opposite and intercepted distinctly below the centre. Length, 6 mm.

I repeat my detailed description of this female on account of the anomaly of the elongate terebra, which lends the species much the appearance of an Ophionid. From the preceding, with which I consider it entirely cogenetic, it differs in the posteriorly broader head, distinct notauli, structure of the metathorax, abdominal puncturation and very much broader areolet.

The type, which is in my collection, is the only individual I had seen and was captured by the Rev. F. D. Morice at Longcross on 17th June, 1904. The Rev. W. F. Johnson took a second female at Poyntzpass, in Co. Armagh, on 30th July, 1909, and has been so good as to present it to me.

TRICHOMASTIX, *Vollenhoven*.

Voll. Tijds. v. Ent. 1878, 160; (?) *Bioblapsis*, Först. Verh. pr. Rheinl. 1868, 162.

Head transverse; frons subexcavate, epistoma centrally prominent; clypeus large, discreted, deplanate and apically subemarginate; mandibles attenuate apically with the upper tooth bifid. Antennae somewhat stout, filiform, pilose, 19-jointed with the three basal joints somewhat slender; of ♀ hardly longer than the head and thorax, of ♂ more elongate and apically subattenuate. Thorax short and gibbulous; metathorax short, rugose and obliquely bicarinate with the areola entire and transverse; spiracles large, circular and conspicuously pale. Scutellum shining and convex, with its lateral margins conspicuously pale and its basal fovea transcostate. Abdomen sessile and basally striolate, of ♀ strongly compressed from the third segment; terebra shortly exerted. Legs a little stout, not black-marked, with base of tibiae and tarsi white. Areolet

wanting; fenestrae large and entire, nervelet indicated; nervellus subopposite and intercepted distinctly below the centre.

This very distinct genus—ausgezeichnete Gattung, as Thomson terms it—is at once recognised by the large and pale metathoracic spiracles and the transcostate scutellar fovea; in the strongly compressed ♀ abdomen it is allied to *Phthorinus*.

Only one species is known.

1. *flavipes*, Holmgr.

Bassus flavipes, Holmgr. Sv. Ak. Handl. 1855, p. 356, ♂; *Trichomastix pallipes* (sic), Thoms. O. E. xiv. 1473, ♂ ♀. *T. polita*, Voll. Tijds. v. Ent. 1878, p. 161, pl. ix, f. 4, ♀. *Bassus tibialis*, Bridg. Trans. Ent. Soc. 1883, p. 170, ♀. *Trichomastix flavipes*, Morl. lib. cit. 1905, p. 425, ♂ ♀.

A very strongly nitidulous black species with only the metathorax and basal, or in ♂ two basal, segments rugulose. Metanotum subglabrous. Mouth, clypeus and in ♂ the face centrally and laterally to the scrobes, a dot beneath and line before the concolorous tegulae, the sides of the scutellum somewhat broadly at least basally, the metathoracic spiracles and sometimes apex of the frenum, flavous. Legs fulvous throughout with only the base of the tibiae and tarsi indeterminately whitish; hind tibiae rarely subinfusate. Abdomen of ♂ normal, broader than high and subcylindrical; of ♀ very strongly compressed from the base of the third segment and often elongately protruded; terebra shortly exerted. Length 7—9 or (if protruded) 11 mm.

My two ♀ ♀ are practically of the same size; but, while one has the abdomen 4 mm. in length and apparently in its normal state, the other has it protruded to a length of 8 mm. or two-thirds that of the whole insect.

Boheman first found the ♂ rarely in Sweden, Kriechbaumer took a ♀ in Silesia, Thomson says it has been bred from a *Syrphus* pupa in Denmark, and van Vollenhoven describes a ♀ from the sea-dunes at Scheveningen, near the Hague, whence van Burgst in 1911 records a female. M. A. Roman told me in 1906 that this species is not found at Upsala, but that near Stockholm he once discovered the males swarming, with but a single female, on the juice of an old oak. Bridgman possessed three British females, two of which were bred by J. E. Fletcher from the pupae of some *Dipteron* dug up at Worcester on 22nd May, 1872, and the third was captured by Norgate, probably (Trans. Norf. Soc. v. p. 629), in Norfolk. I possess a male in Dr. Capron's collection, probably taken at Shere, in Surrey; and Bignell has kindly given me two of the four females captured by him on 17th June, 1889 (E. M. M. 1908, p. 136) at sap caused to flow from an old oak tree by the action of larvae of *Cossus ligniperda* in the Walkham Valley, near Grenofen Bridge.

TRIBE

TRYPHONIDES.

The members of this tribe are among the commonest and most generally met with of our indigenous Ichneumonidae and it is they that one finds so frequently, with no idea whence they come, by swinging a net to and fro in the glades of woods during May and June. To the general collector, this group is associated with spring work and especially woods, though, in reality, they are no less common in gardens and about the borders of meadows and streams, both then and throughout the summer, up to quite late autumn, for they exclusively prey upon the sawflies or Tenthredinidae, which have so long a spell of life in the perfect state, ranging from the early *Doleri* to be met with in March to the laggard *Emphytus serotinus*, still abroad during the early days of November. Consequently Tryphonides may be seen throughout all but the quite dead months of the year, for I fancy they are peculiarly uniform in economy, and all hibernate as larvae in their pupal cocoons or those of their hosts, however many broods or successions of emergences there may be in the course of a summer. Specimens of this Tribe are extremely abundant with us and I noted that I possessed a little over sixteen hundred of them when I came to work upon the present part of my volume in June, 1910; of these rather more than one could not be satisfactorily determined and I am extremely averse to erecting presumably new species in a group where we already appear to have fully the usual percentage of parasites specifically, and far more prevalently, than Tenthredinid hosts. The Rev. F. D. Morice has been tabulating our indigenous sawflies in a peculiarly concise and satisfactory manner since 1903, with the result that there are now very few genera to be treated of in his *Help Notes*, and we are enabled to judge the number of British species to be about three hundred and fifty. Upon these are already recorded over two hundred parasites of the Ichneumonidae alone. Consequently I have been most reluctant to introduce any of the latter that were not well established as British, though the line was difficult to draw in view of the very numerous erroneous determinations made by our older authors, who worked exclusively with Gravenhorst's *Ichneumonologia*, even long after Holmgren's earlier works had appeared. Most of our knowledge respecting their economy comes from Germany and but little has been done in this respect in England, where sawflies are only beginning to be appreciated as a most fascinating group of insects. We may hope, I think, that ere long with the growth of this interest their parasites will be more freely bred and those of the present Tribe which do not prey upon them (if there be any such, as I have suggested under the genus *Tryphon*) will be found peculiarly interesting in unique economy, associated with insects, probably of their own Order, hitherto unknown to suffer from ichneumonid attacks. From an economic point of view those kinds preying upon the numerous noxious and often appallingly destructive species of *Lyda* and *Nematus*, *Eriocampoides* and *Emphytus* are among the most beneficial of all Ichneumonidae.

The distinctions between the Sub-tribes falling in this division are good in their very artificiality. Species with no hind calcaria have been picked

from the other Sub-tribes and grouped together under the name Cteniscini, whether their abdomen be sessile or subpetiolate; thus they combine the more salient features of both the Tryphonini and Mesoleptini, between which I have ventured to place them, as a first step towards a more natural grouping. The Ctenopelmini are distinct from the foregoing in their pectinate tarsal claws, though their facies are scarcely more homogeneous than those of the Cteniscini. The only real difficulty to be contended with in these main divisions is between the Tryphonini and the Mesoleptini, which run into one another in such a manner as to render any fast line difficult, though in the more extreme cases of abdominal sessility and petiolation their position is obvious. Excepting those genera placed in the Ctenopelmini, I have followed Thomson more or less closely in the position of his genera, though these are rarely here considered as more than generic divisions; consequently I may present a comparison of his distinctions of these two groups:—

TRYPHONINI.

Eyes glabrous.
 Pronotal epomiaæ large.
 Notauli wanting or obsolete.
 Sternauli and supracoxal areae often indicated.
 Abdomen SESSILE OR SUBSESSILE.
 First segment broad, always with discal carinae and its ventral membrane extending nearly to the base, very often with its spiracles BEFORE ITS CENTRE.
 Spicula simple.
 Tarsal claws often stout.

MESOLEPTINI.

Eyes sometimes pilose.
 Pronotal epomiaæ usually wanting or short.
 Notauli usually more or less distinct.
 Sternauli and supracoxal areae very rarely indicated.
 Abdomen DISTINCTLY PETIOLATE.
 First segment basally petiolate, always sublinear and elongate, with discal carinae sometimes wanting, membrane often short and spiracles ALWAYS SLIGHTLY BEYOND CENTRE.
 Spicula generally sinuately incised above.
 Tarsal claws simple.

Table of Sub-tribes.

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| (2). | 1. Hind calcaria entirely wanting, rarely extremely obsolete | 2. CTENISCINI. |
| (1). | 2. All the calcaria normal and elongate. | |
| (6). | 3. Tarsal claws not at all pectinate. | |
| (5). | 4. Abdomen sessile or subsessile, with no trace of petiole | 1. TRYPHONINI. |
| (4). | 5. Abdomen petiolate and distinctly constricted before base | 3. MESOLEPTINI. |
| (3). | 6. Tarsal claws more or less distinctly pectinate internally | 4. CTENOPELMINI. |

SUB-TRIBE

TRYPHONINI.

The utter lack of all petiole will distinguish this division from all others but certain Cteniscini, which differ in their lack of calcaria and certain Ctenopelmini, which are known by their pectinate tarsal claws. Elsewhere it can only be confounded with certain Lissonotids, the females of which have the terebra at least somewhat exerted and both sexes are usually so evenly and closely sculptured as to present a far more uniform and less nitidulous surface than in the present group, where the puncturation is either so sparse as to render them strongly shining or so coarse as to lend the surface an uneven appearance. Many can be divided from the Bassides only by their mandibular structure.

Table of Genera.

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| (12). | 1. | First segment more or less contracted basally; head usually constricted behind. | |
| (9). | 2. | Vertex of head somewhat narrow and not dilated posteriorly. | |
| (6). | 3. | Basal segment narrow to apex, its spiracles prominent and subcentral. | |
| (5). | 4. | Areolet entire; nervellus intercepted below centre | LABROSSYTA, <i>Först.</i> |
| (4). | 5. | Areolet wanting; nervellus intercepted at its centre | SPHECOPHAGA, <i>Westw.</i> |
| (3). | 6. | Basal segment evenly explanate, its spiracles antecentral and not prominent. | |
| (8). | 7. | Metapleurae dentate next hind coxae; nervellus postfurcal | PROTARCHUS, <i>Först.</i> |
| (7). | 8. | Metapleurae not dentate; nervellus very rarely postfurcal | MESOLEIUS, <i>Holmgr.</i> |
| (2). | 9. | Vertex of head broad and somewhat dilated posteriorly. | |
| (11). | 10. | Second segment obliquely impressed; vertex basally angulated | DYSPETES, <i>Först.</i> |
| (10). | 11. | Second segment not obliquely impressed; vertex simple | TREMATOPYGUS, <i>Holmgr.</i> |
| (1). | 12. | First segment hardly narrower basally than apically; head not constricted behind. | |
| (14). | 13. | Petiole not basally auriculate; abdomen parallel-sided | TRYPHON, <i>Fall.</i> |
| (13). | 14. | Petiole laterally dentate at its base; abdomen obconical | OTOBLASTUS, <i>Först.</i> |

LABROSSYTA, Förster.

Först. Verh. pr. Rheinl. 1868, p. 202; *Labrossytus*, Thoms. O. E. xix. 2001; *Lapaphras*, Cam. Journ. Bombay Nat. Hist. Soc. 1902, p. 428.

Head with the eyes not internally emarginate; clypeus apically rounded and strongly punctate; mandibles not stout, with the lower tooth longer and stronger than the upper. Antennae filiform. Thorax with no notauli, epomiae nor areae, and the epicnemial abbreviated above; metapleural carinae distinct. First abdominal segment short and not explanate basally with spiracles before centre, somewhat prominent and emitting no carinae to apex of segment; postpetiole laterally immarginate; second segment with no basal lateral carinae, nor thyridii. Legs not slender, with tibial calcaria short. Areolet distinct, irregularly oblique, petiolate, neither large nor rhomboidal; radius emitted far before centre of stigma; nervellus intercepted distinctly below its centre. Wings strongly infusate.

This genus differs from *Syndipnus*, of which it was considered to form a section by Thomson, in the possession of a distinct areolet, etc. So little has been known of its single palaearctic representative that Marshall left it in 1872, as placed by Stephens, in the genus *Tryphon*; Bridgman considered it a *Perilissus*. Two American and one Indian species, the type of which I have seen, are known in this genus.

1. *scotoptera*, Grav.

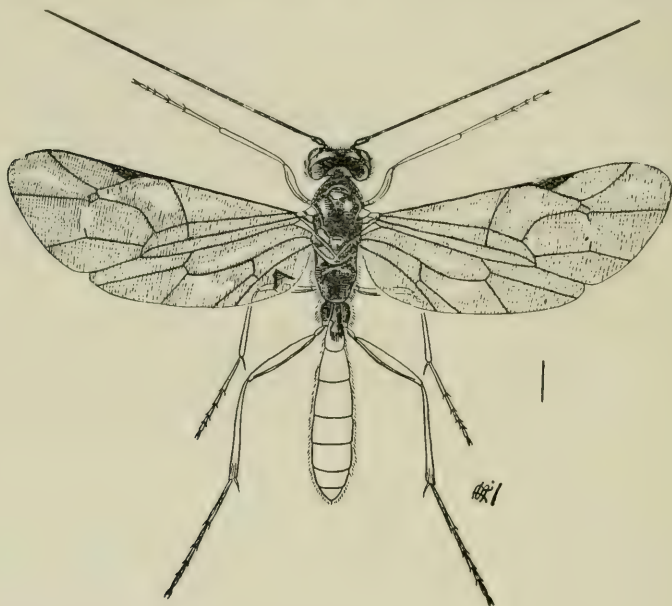
Ichneumon scotopterus, Gr. Mem. Sc. Torin. 1820, p. 377, ♂ ♀. *Tryphon scotopterus*, Gr. I. E. ii. 244; Ste. Ill. M. vii. 250; Fonsc. Ann. Soc. Fr. 1849, p. 225, ♂ ♀. *Syndipnus (Labrossytus) scotopterus*, Thoms. O. E. xix. 2001. *Perilissus fumatus*, Bridg. Entom. 1880, p. 54; cf. Trans. Ent. Soc. 1889, p. 432 et Trans. Norf. Soc. v. p. 625.

A bright orange insect with the wings very strongly infusate and the head, thorax and basal segment alone black. Mouth flavidous; antennae infusate above. Scutellum black, convex and glabrous; metathorax evenly rounded and declived with erect griseous pilosity, but no areae. Abdomen smooth and shining with spiracles of the basally constricted and mainly black first segment prominent and distinctly before its centre. Coxae and tarsi alone nigrescent. Length, 6 mm.

Very distinct from all other Tryphoninae in the nigrescent wings; the abdomen is said to be rarely partly infusate. I cannot understand Strobl wishing to place it next to the genus *Erromenus*, to which it bears but little relationship and least of all in its simple claws.

Austria, France, Piedmont and in May near Breslau (Grav.); Fonscolombe and Thomson also record it from France. It has not been bred, but is probably parasitic on Nematids; except for the dark wings, it superficially resembles *Pachynematus albipennis*, Htg. "Rare: obtained from Mr. Haworth's collection" (Steph.); "It is common in England, but I was without specimens until last summer, when I found them at St. Albans" (Marshall, Ent. Ann. 1874, p. 144); there is one thence in his collection. One ♂, at Shere (Capron); one ♀, "Deal Sandhills, 1890" (Piffard). Earlham in June (Bridgman); and on 8th June, 1901, I too

took one in a chalk-pit at Earlham, near Norwich; but it is certainly a rare species, for upon one occasion only have I met it in any numbers. This was by sweeping long grass on the edge of a deep ditch on the borders of Stanstead Great Wood at 5 p.m. on 14th June, 1900; I took half-a-dozen (which strongly resembled both *Athalia lineolata*, Lep. and



Beris clavipes, Linn., with which they occurred) and many more were about, but rain began to descend: I have not again met with it.

SPHECOPHAGA, Westwood.

Westw. Introd. ii (1840), Synop. 57; *Cacotropa*, Thoms. O. E. xii (1888), 1259.

Head vertically emarginate and not narrow; occiput centrally, and eyes internally, entire; clypeus centrally subreflexed and laterally emarginate in front; labrum free. Antennae somewhat stout; flagellum with short, stiff pilosity and its first joint longer than second. Thorax dull, with notauli extending beyond centre; sternaui fine, but distinct and subelongate; metathorax very short, apically abruptly truncate and transversely carinate only above; costulae wanting; spiracles oval and not large. Scutellum dull and deplanate, with its basal fovea coarsely striolate. Abdomen dull and ovate; first segment short and not auriculate basally, but sulcate to beyond its centre, with spiracles central and prominent; thyridii obsolete; terebra not exerted. Legs somewhat stout, with the hind tarsi attenuate throughout and neither slender nor spinose; claws small; intermediate femora not dentate. Wings sometimes abbreviated; areolet wanting; stigma not broad, emitting radius

from its centre; discoidal cell nearly double length of brachial, which emits the anal nervure from a little below its centre; basal nervure continuous; nervellus subopposite and intercepted in the centre.

This genus has been variously termed *Sphegophaga*, *Chyronomon*, *Cacotropa* and, incorrectly by myself, *Sphegophaga*. I have already given a detailed account of it (E. M. M. 1900, pp. 117—124) and it is only necessary to here give a précis, with such additional matter as has come to my knowledge during the last ten years. A single European and a single American species are alone known.

1. *vesparum*, Curt.

Anomalon vesparum, Curt. B. E. pl. et fol. cxviii, ♀. *Tryphon vesparum*, Ratz. Ichn. d. Forst. iii. 128, ♀. *Cacotropa sericea*, Thoms. O. E. xii. 1259; Bloesch, Feuil. jeun. Nat. 1895, p. 75, ♂ ♀. *Sphegophaga vesparum*, Morl. E. M. M. 1900, p. 118, ♂ ♀.

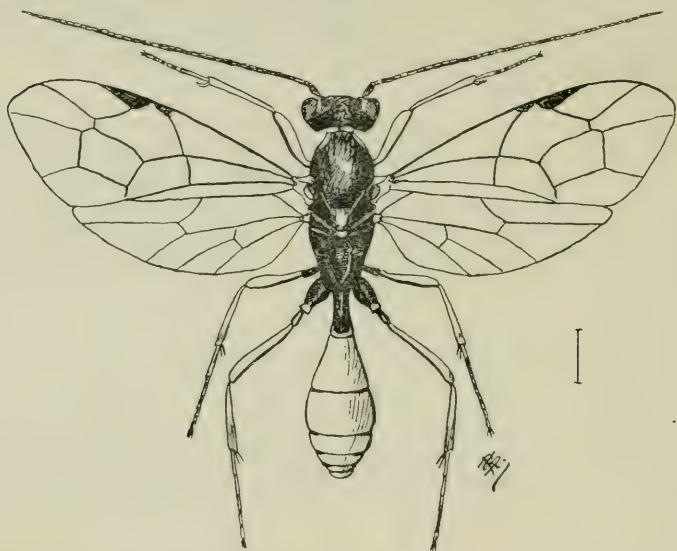
A black and very dull species with the pronotum white-marked, the abdomen mainly castaneous and legs dark red. Head normal and black, very closely and finely punctate, with the labrum and inner orbits narrowly, and in ♂ also the face, mouth and cheeks, white; mandibular teeth of equal length. Antennae longer than thorax, with rigid pile and not apically attenuate; black, or in ♂ with scape white beneath. Thorax discally subdeplanate, very dull with tegulae, radical callosities, a pronotal line and ♂ mesoternum laterally, white; metathorax with petiolar area extending beyond centre, nitidulous and hardly punctate; areola entire in macropterous form only. Scutellum black. Abdomen suboval in macropterous, broadly ovate in brachypterous, form; densely and very finely punctate, centrally or entirely or except its base, castaneous-red; second segment subtransverse and the basal curved. Legs fulvidous with coxae, trochanters and tarsi black, anterior legs of ♂ basally white beneath; hind tibiae subinfusate; calcaria of unequal length. Wings subhyaline with stigma infusate and radius not always apically curved. Length, 4—7 mm.

The development of the wings is variable in this species, and that of the thorax and shape of the abdomen appears to vary in direct ratio: brachypterous examples have the metathoracic costae ill defined, the petiolar area often striate and the abdomen not only paler but more broadly ovate. In one example, in Bridgman's collection, the antennae, though both perfect, are of very unequal length. Curtis beautifully figures the brachypterous, and André (Spp. Hym. d'Europ. ii. pl. xxxiv, fig. 6) indifferently the macropterous, form.

The eggs are laid upon the bodies of wasp grubs, even in the earliest-made layer of the latter's nest, to no particular part of which they are confined. The parasitic larvae subsist upon the wasp grubs until the latter become full fed and seal down the operculum of their cells; they then devour the remainder of the grub from below, shielded from attack both by the operculum and demolished pupa skin, the head of which remains intact immediately below the operculum and though at first full of fluid, later becomes dessicated. The larva of *Sphegophaga* is said by André (*l.c.* p. 508; pl. xxxiv, fig. 8) to be somewhat elongate, a little curved, attenuate at both extremities and somewhat swollen centrally;

soft, fleshy and white. The head is narrower than the anus, white and showing only somewhat indistinct traces of labrum and mandibles; it is blind and apodous, possessing only some transverse fleshy ridges on the back of the abdominal segments; length of adult larva 9—10 mm., with a central diameter of some 3 mm.

Having demolished its host the larva constructs a very strong cocoon for itself at the bottom of the wasp-cell,* sufficiently stout to resist all attacks of the wasps to dislodge it, since the latter's eggs are sometimes deposited upon this cocoon. The cocoon is oblong, hexagonal-cylindrical, rounded below, with the operculum flat or a little concave (André, xxxiv, 7), and often longitudinally wrinkled; within the cocoon has a beautifully delicate gold-coloured lining, in which the nymph is enwrapped; the length is about 6 mm. and diameter some $3\frac{1}{2}$ mm. The



parasite emerges through a clean cut orifice in the centre of the operculum; the cocoons are said to have a strong smell like that of formic acid. It does not yet appear plain whether there be two distinct broods in the course of a year; if such be the case, some evidence exists that the brood emerging in the spring is fully winged, since it hatches out in the empty wasps' nest, whereas that emerging later in the year is brachypterous, since there can be no need for it to vacate the then fully tenanted nest in order to propagate its race, and all the brachypterous examples I have seen were taken from the interior of the nests. But nothing is yet known respecting its oviposition. Undetermined *Chalcididae* have been

* No other host is yet recorded but Bignell says, after considerable experience of this parasite, "*Sphecophaga* is certainly not confined to the genus *Vespa*: it is quite impossible for a footless grub to leave the wasps' nest to pupate somewhere else. It might turn out to be a parasite on *Osmia rufa*, and I have an idea that I removed the cocoon from an old wall infested with that bee" (in *lit.* 3rd Dec., 1901). But it certainly pupates inside the wasps' nest. He adds, more definitely (in *lit.* 23rd Feb., 1909), "It does not confine itself to wasps, as I have obtained its cocoon from a colony of *Osmia rufa* that had taken possession of the sunny side of a house at Roberough, five miles from Plymouth, on 5th September, 1901." L. Semichon has recently published a "Note biologique" on this species in *Bul. Soc. Ent. France*, 1908, p. 79.

raised from this parasite's cocoons (Kirby, Bridgewater Treatise, 1835, ii. 334; Hope, Proc. Ent. Soc. 1838, p. iii; Stone, *l.c.* 1865, p. 65); and Donisthorpe has bred a Braconid, referred to by me (E. M. M. 1900, p. 123), belonging to the *Alysiides* but almost certainly attacking the Dipterous larvae, mentioned by him (Ent. Rec. 1898, p. 307), and not our ichneumon.

S. vesparum has been bred from the nests of *Vespa vulgaris*, *V. rufa* and *V. germanica*, though commonest in Britain in those of the first named. It appears to be but little known on the Continent, where it has a somewhat restricted range from East Gothland through Germany and Switzerland to France. With us it is doubtless commoner than at present suspected; I have already recorded it from Cumprall Hall (Curtis); near Manchester (R. Wood); South Devon (Bignell); Norwich (Bridgman); Hereford (Chapman); Yorkshire (Smith, Brit. Acul. Hym. 1858, 218); Chiddingfold (Donisthorpe); Boxhill (Beaumont); and Wellington College, Reading (Hamm). I possess examples from Shere in Surrey (Capron); Kings Lynn, Norfolk, June, 1903 (Atmore); Wyre Forest, June, 1893 (Martineau); several in Mr. Adams' "trap" at Lyndhurst, June, 1907 (Elliott); Bickleigh in Devon, 23rd May (Bignell); Painswick in Gloucester (Watkins); and myself took a female on 15th June, 1898, on my study window in Ipswich.

PROTARCHUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 201; Thoms. O. E. xvii. 1872.

Head and thorax rugulose punctate and coarsely pubescent; eyes not internally emarginate, frons impressed, mandibular teeth of subequal length, short and obtuse. Metathorax not completely areolated, subabruptly declived apically, with petiolar area extending nearly to its centre and longitudinally carinate to apex; metapleuræ dentate before hind coxæ. Scutellum and postscutellum convex and pale. First segment not basally dentate laterally, a little explanate throughout, bicarinate to far beyond its centre, with prominent spiracles before that point. Legs elongate. Nervelet distinct and elongate; upper basal nervure strongly oblique and apically straight; nervellus postfurcal, intercepted above its centre. Antennæ and often metanotum red.

The large size of its species, their brilliant colouration and rugulose sculpture, render this genus distinct.

1. *rufus*, Grav.

Tryphon rufus, Gr. I. E. ii. 200; Ratz. Ichn. d. Forst. ii. 117, ♀. *T. rufulus*, Ste. Ill. M. vii. 244, pl. xxxvi, fig. 3, ♂. *T. conspicuus*, Ste. lib. cit. 244, ♀. *Mesoleius rufus*, Holmgr. Sv. Ak. Handl. 1855, p. 133; *l.c.* 1876, p. 4; Brisch. Schr. Nat. Ges. Danz. 1878, p. 77, ♀; Voll. Pinac. pl. xxiii, fig. 1, ♂. *Protarchus rufus*, Thoms. O. E. xvii. 1872, ♀.

Very little shining, black with mouth, face, humeral and mesopleural marks, and scutellum flavous. Clypeus apically depressed; all the orbits and antennæ, except upper side of scape, orange. Metathorax usually more or less broadly testaceous on either side of disc; its areæ irregular.

Abdomen testaceous with basal three-fourths of the first segment, and the fifth to anus, black. Legs very long and stramineous or testaceous with the hind tibiae, except their more or less nigrescent apices, paler; usually their hind coxae above and more or less of the hind femora black. Tegulae, radix and callosity before them, stramineous; stigma of ♂ flavous, of ♀ piceous and basally paler. Length, 15—18 mm.

It is said to occur in damp pine woods in southern Lapland, Sweden, Germany, Belgium and France. One female was bred by Dahlbom at Lund from the cocoon of *Cimbex variabilis* (Ratz. l.c.); bred from larvae of *Trichiosoma lucorum* and *T. Sorbi*, Htg. = *Scalesii*, Cam., in Prussia (Brischke l.c.). "Very rare: taken in June in the New Forest, and at Sheffield; also near Kimpton by the Rev. G. T. Rudd, to whom I am indebted for one sex" (Stephens). No one has mentioned it in Britain since 1835, but there is an unlocalised pair in Marshall's collection. In 1903, Waterston sent me a fine female from Taynult, together with the cocoon of *Trichiosoma*, fastened to a birch twig from which it had emerged; this was entirely occupied by the white, silken cocoon of the parasite; Rev. F. D. Morice has another female, emerged from a similar cocoon at Aviemore. Perhaps it is a northern species with us, for Mr. C. H. Mortimer has recorded (E.M.M. 1910, p. 39) a female taken by him in the little isle of Soay by Skye in September, 1909. I possess a fine series of both sexes from the late J. A. Clarke's collection, unfortunately with no data, though certainly British. It was first found here by Curtis (Proc. Ent. Soc. 1853, p. 136), who bred it in 1828 from cocoons of his *Trichiosoma pratense* near Ambleside. Cameron's record of this species from *Cladius viminalis* (ii. 30) is a careless error, referring to *Mesoleius armillatorius*; his indices to parasites are very faulty.

MESOLEIUS. *Holmgren.*

Holmgr. Sv. Ak. Handl. 1854, p. 62; *lib. cit.* 1855, p. 130.

Head transverse and not buccate, with the vertex emarginate; clypeus generally distinctly discreted with its apex truncate, emarginate, rarely rounded throughout or centrally subproduced; mandibular teeth subequal in length. Antennae elongate, setaceous and sometimes longer than body; scape ovate; basal flagellar joint not rarely half as long again as the second. Thorax rarely deplanate, usually nitidulous; notauli strong or obsolete; metanotal areae usually distinct, costulae always wanting; petiolar area generally entire but always small; pleurae of variable sculpture, with the speculum (the convex area immediately below the wings) usually glabrous and glittering. Scutellum subconvex, very often pale. Abdomen oblong-ovate or sublanceolate, often a little compressed at its apex in ♀, or throughout most of its length in Saotus-group; first segment gradually and evenly constricted basally, with the extent of discal carinae and their intermediate sulcus variable; spiracles before centre; terebra straight and rarely extending beyond anus. Legs always distinctly slender with the hind femora elongate. Wings subample with areolet usually entirely wanting, or complete and triangular, often petiolate; disco-cubital nervure subarcuate, rarely nearly straight; nervellus opposite or antefurcal, very rarely postfurcal.

Since the great majority of the species of *Tryphon*, placed alpha-

betically as being doubtfully referred to it, in our last Catalogue by Marshall in 1872, really belong to the present genus, it may be well to here indicate their correct location. Of *Tryphon quadrisculptus* I have already treated (Ichn. Brit. iii. 137); *T. albocinctus*, *T. basalis*, *T. cephalotes*, *T. flavomaculatus*, *T. laticeps*, *T. lincola*, *T. mitigosus*, *T. ridibundus* and *T. tricolor* will be found under the Cteniscini. *T. albocinctus*, *T. bidentatus*, *T. bisculptus*, *T. obscurus* and *T. trisculptus* belong to Polyblastus; *T. chrysopus* to Monoblastus; and both *T. calcator* and *T. fasciatus* to Erromenus. *T. bimaculatus*, Desv., is *Euryproctus notatus*, also here treated under Tryphon; and closely allied to *T. ochrostomus* and *T. xanthostomus*. *T. involutus* will be found under Ctenopelma and *T. iratus* is a Cataglyphus. *T. orbitalis* is an Ecclinops and *T. scotopterus* raised to generic rank under Labrossyta. The remaining twenty-two species are referable to Mesoleius, as I present it, with the exception of *T. clypeator* = *Lissonota cylindrator* (Ichn. Brit. iii. 204), *T. nitidus* = *Meniscus agnatus* (l.c. 232), *T. quadrilineatus* = *Cryptopimpla blanda* (l.c. 182, over which its earlier pagination gives it priority), and *T. subspinosus* = *Phygadeuon grandiceps*, Thoms., not yet otherwise known as British and doubtless misnamed. In fact I fear there has been a good deal of misnaming by our older British authors among these difficult insects; and I have, consequently, refrained from considering *T. calceolatus*, Gr., *T. fulvilabris*, Gr., and *T. humilis*, Gr., the types of which Pfankuch declares lost; as well as *T. flavilabris*, Ste., *T. fulvilabris*, Ste., and *T. zonatus*, Ste., which are in similar plight. *T. (Mesoleius) flavicinctus*, *T. (Perispudus) flavipes*, *T. (Alfkenia) integrator* of which there is an example named by Grav. in Mus. Brit., *T. (Amorphognathon) melanocerus*, *T. (Spudaea) nasutus*, *T. (Otlophorus) nigratarsus* and *T. (Mesoleius) nigrolineatus* I consider misnamed as British by Desvignes and Stephens, all of whose specimens I have examined.

Table of Species.

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| (10). | 1. Metanotal areae entirely wanting; basal nervure oblique; anal nervure emitted below centre of brachial cell. | |
| (9). | 2. Petiole laterally immarginate; clypeus not apically emarginate [BARYTARBUS, Thoms.]. | |
| (6). | 3. Antennae not white-banded; areolet small [POLYTERES, Thoms.]. | |
| (5). | 4. Hind calcaria longer than half metatarsus, their tibiae black; scutellum pale | 1. VIRGULTORUM, Grav. |
| (4). | 5. Hind calcaria shorter than half metatarsus, their tibiae red; scutellum black | 2. USTULATUS, Desv. |
| (3). | 6. Antennae white-banded; areolet entirely wanting. | |
| (8). | 7. Scutellum and abdomen black; length 12 mm. | 3. SEPULCHRALIS, Holmgr. |
| (7). | 8. Scutellum and centre of abdomen pale; length, 8 mm. | 4. COLON, Grav. |
| (2). | 9. Petiole laterally margined; clypeus apically emarginate [LAMACHUS, Thoms.]. | 5. PINI, Bridg |

- (1). 10. Metanotal areae not entirely wanting; basal nervure vertical; anal nervure not emitted below centre of brachial cell.
- (12). 11. Scape very small, basal flagellar joint large with discal protuberance .. 6. BRACHYACANTHUS, *Par.*
- (11). 12. Scape and basal flagellar joint normal.
- (14). 13. Nervellus postfurcal, intercepted above centre; mesopleurae regularly punctate, with interstices glabrous [OTLOPHORUS, Thoms.]. 7. VEPRETORUM, *Grav.*
- (13). 14. Nervellus not postfurcal, intercepted at or below centre; mesopleurae irregularly punctate, with interstices nearly always alutaceous.
- (28). 15. Basal flagellar joint at least half as long again as second; thorax deplanate.
- (21). 16. Notauli obsolete; petiolar spiracles central [LARGAROTUS, Thoms.].
- (20). 17. Clypeus apically subtruncate and depressed; antennae not red.
- (19). 18. Thorax immaculate, with hardly traceable notauli 8. SEMICALIGATUS, *Grav.*
- (18). 19. Thorax pale at radices, with somewhat obsolete notauli 9. FALLAX, *Holmgr.*
- (17). 20. Clypeus apically emarginate and not depressed; antennae at least apically red 10. ERYTHROCERUS, *Grav.*
- (16). 21. Notauli distinct; petiolar spiracles before centre [SCOPESUS, Thoms.]
- (27). 22. Hind tarsi nigrescent; abdomen mainly red; apical maxillary palpal joint not longer than penultimate.
- (26). 23. Clypeus apically depressed and not nasutely produced centrally; petiolar sulcus wanting; nervellus opposite.
- (25). 24. Hind femora rufescent; ♂ humeral pale marks obsolete 11. RUFOLABRIS, *Zett.*
- (24). 25. Hind femora black; ♂ humeral marks broadly flavous 12. BICOLOR, *Grav.*
- (23). 26. Clypeus apically not produced; petiolar sulcus obsolete; nervellus antefurcal 13. RUFONOTATUS, *Holmgr.*
- (22). 27. Hind tarsi and abdomen flavous; apical maxillary palpal joint longer than penultimate 14. NIGRICOLLIS, *Grav.*
- (15). 28. Basal flagellar joint not or hardly longer than second; thorax normal.
- (78). 29. Body always distinctly punctate and discally dull; abdomen not or only apically compressed; length, 6 mm. or more [MESOLEIUS, Thoms.].

- (45). 30. Abdomen centrally broadly red or castaneous; basal flagellar joint slightly longer than second; areolet always wanting.
- (38). 31. Face of ♀ black, at most with orbits narrowly pale.
- (35). 32. Radius apically straight; radial cell short; wings not ample; apex of fourth segment black.
- (34). 33. Scutellum and anus immaculate black 15. DORSALIS, *Grav.*
- (33). 34. Scutellum and anus broadly rufescent 16. ELEGANS, *Parf.*
- (32). 35. Radius apically curved; radial cell not short; wings ample; apex of fourth segment red.
- (37). 36. Metanotal areola obsolete; anus entirely rufescent 17. HAMULUS, *Grav.*
- (36). 37. Metanotal areola complete; anus entirely black 18. IGNAVUS, *Holmgr.*
- (31). 38. Face of ♀ entirely pale, at most with a central black line.
- (40). 39. Nervellus opposite; thorax distinctly elongate 19. TENUIVENTRIS, *Holmg.*
- (39). 40. Nervellus antefurcal; thorax normal.
- (42). 41. Scutellum flavous; head slightly constricted behind 20. ARMILLATORIUS, *Grav.*
- (41). 42. Scutellum black; head strongly constricted posteriorly.
- (44). 43. Mesosternum immaculate black; radical callosities pale 21. SCAPULARIS, *Stephens.*
- (43). 44. Mesosternum pale-marked; radical callosities not pale 22. MOLESTUS, *Holmgr.*
- (30). 45. Abdomen not red-marked, at most discally pale testaceous; basal flagellar joint not longer than second; areolet sometimes entire.
- (49). 46. Speculum alutaceous throughout and very dull.
- (48). 47. Hind coxae immaculate red, their tibiae broadly white 23. AULICUS, *Grav.*
- (47). 48. Hind coxae black, their tibiae immaculate red 24. AXILLARIS, *Steph.*
- (46). 49. Speculum glabrous and very glittering.
- (77). 50. Clypeus not broadly rounded throughout; body not strongly elongate.
- (70). 51. Thorax normal, clypeus apically sinuate or emarginate.
- (63). 52. Apex of clypeus subnasutely produced, laterally subdilated; scutellum rarely red.
- (62). 53. Sulcus and carinae of petiole obsolete.
- (59). 54. Mesopleurae glabrous, strongly nitidulous above.
- (56). 55. Venter black or nigrescent throughout; length 9 mm. or more 25. CALIGATUS, *Grav.*
- (55). 56. Venter more or less broadly pale; length rarely up to 9 mm.
- (58). 57. Mesonotum broadly red; head posteriorly constricted 26. VARIEGATUS, *Fur.*

- (57). 58. Mesonotum not red-marked; head posteriorly buccate 27. SEGMENTATOR, *Holmgr.*
 (54). 59. Mesopleurae alutaceous throughout, somewhat dull above.
 (61). 60. Scutellum red or flavous; notauli weak and apically obsolete 28. HAEMATODES, *Grav.*
 (60). 61. Scutellum black; notauli deeply impressed throughout 29. MACULICOLLIS, *Steph.*
 (53). 62. Sulcus and carinae of petiole strong 30. STERNOXANTHUS, *Grav.*
 (52). 63. Apex of clypeus not centrally produced and laterally hardly dilated; scutellum red.
 (65). 64. Ventral plica broadly black-marked 31. DUBIUS, *Holmgr.*
 (64). 65. Ventral plica entirely white or flavous.
 (67). 66. Second segment apically pale; mesopleura glabrous above 32. FURAX, *Holmgr.*
 (66). 67. Second segment black; mesopleurae alutaceous.
 (69). 68. Mesonotum black; notauli almost wanting 33. OPTICUS, *Grav.*
 (68). 69. Mesonotum fulvous throughout; notauli distinct 34. FORMOSUS, *Grav.*
 (51). 70. Thorax stout; clypeus apically truncate or subtruncate.
 (76). 71. Petiolar area somewhat distinct; thorax short.
 (75). 72. Notauli very determinate and extending to apex.
 (74). 73. Hind tibiae entirely black; scutellum pale 35. CANINAE, *Bridg.*
 (73). 74. Hind tibiae broadly white-banded; scutellum black 36. FILICORNIS, *Holmgr.*
 (72). 75. Notauli slender and hardly extending to apex 37. PYRIFORMIS, *Ratz.*
 (71). 76. Petiolar area obsolete; thorax elongate 38. MULTICOLOR, *Grav.*
 (50). 77. Clypeus broadly rounded apically; body strongly elongate 39. NIGER, *Grav.*
 (29). 78. Body glabrous and strongly nitidulous; abdomen strongly compressed from centre; length 5 mm. or less [SAOTUS, Thoms.].
 (80). 79. Abdominal incisures not constricted; hind coxae pale 40. RENOVATUS, *Morl.*
 (79). 80. Third segment constricted; hind coxae basally black 41. COMPRESSIUSCULUS, *Th.*

1. *virgultorum*, *Grav.*

Tryphon virgultorum, Gr. I. E. ii. 172, ♀. *Mesoleius Virgultorum*, Holmgr. Sv. Ak. Handl. 1855, p. 159; *M. virgultorum*, l. c. 1876, p. 48; *M. (Barytarbus) Virgultorum*, Thoms. O. E. ix. 931; *M. [B. (Polytreres)] Virgultorum*, Thoms. O. E. xvii. 1873, ♂ ♀.

Head hardly constricted posteriorly; clypeus apically depressed, subtruncate and obsoletely margined; palpi and a central mandibular mark pale testaceous. Antennae black, becoming apically rufescent. Thorax shining, stout and anteriorly elevated with a pale testaceous callosity

before radices; notauli slender and indicated to apex; mesopleurae very finely sculptured and nearly glabrous above; areolar and petiolar carinae nearly entirely wanting. Scutellum and postscutellum flavidous. Abdomen entirely black, smooth and somewhat nitidulous; basal segment hardly longer than hind coxae with obsolete sulcus and carinae, postpetiole laterally immarginate; third segment broader than long. Legs red, with hind tarsi and tibiae entirely black; hind legs stout and elongate, their tibiae spinulose and calcaria longer than half metatarsus; all claws stout. Wings with stigma pale infusate, radix and tegulae dull stramineous; areolet minute, irregular and emitted from apical angle of recurrent nervure; nervellus subopposite or slightly postfurcal. Length, 10 mm.

This species is known by the entirely black abdomen, hind tibiae and tarsi, and by the elongate and stout hind legs with elongate calcaria. It is retained in Thomson's subgenus *Barytarbus* by Pfankuch in 1906 and this cannot be *Barytarbes* of Förster, which is characterised by white-banded antennae and total lack of all metanotal carinae, nor can it be placed, as is done by Dalla Torre, in Förster's *Polytrera*, which has the nervellus intercepted far below its centre. I have seen examples with the areolet wanting, but usually it is strong and petiolate; the antennae are stout, elongate and often mainly red.

It appears to be of infrequent occurrence on the Continent from southern Sweden, through Germany where Brischke did not find it, to France; but has not yet been bred. With us, however, it is certainly common and was contained in Stephens' collection, though I have taken only females in the Bentley Woods on 31st May, 1903, flying along and examining the twigs of a hawthorn hedge on an extremely hot afternoon, and sitting on a flower of *Echium vulgare* at Brandon in Suffolk on 11th June, 1908. I have a nice series from Surrey in Capron's coll. and several from the New Forest (Miss Chawner), S. Leverton in Notts in June, 1897 (Thornley), Guernsey in August, 1908 (Luff), Felden Herts (Piffard) and Freshford near Bath in May (Charbonnier). Marshall took it at Cornworthy and Botusfleming, Bridgman at Eaton near Norwich in June and July, Atmore at Kings Lynn in 1906 and Col. Nurse in June, 1906, at Ingham in west Suffolk.

2. *ustulatus*, Desv.

Tryphon ustulatus, Desv. Cat. 1856, 38, ♀.

A large, black and strongly nitidulous species with the mouth, clypeus, antennae except scape above, radices, radical callosities, tegulae and whole legs clear red, with the hind tarsi and apices of their tibiae alone infusate. Metanotum strongly coarctate; basal segment petiolate and subulcate to beyond its centre; abdomen convex with extreme base of second and third segments hardly perceptibly badius, anus subcompressed, venter not pale; stigma ferrugineous. Length, 12 mm. ♀ only.

This unique specimen agrees with *M. virgultorum* in the neuriation excepting the more oblique lower basal nervure and much more strongly rounded discoidal nervure, in the nitidulous body, stout legs and smooth, convex metathorax, but is abundantly distinct in its larger size, red clypeus and hind tibiae, shorter hind calcaria which do not reach centre of

their metatarsi, black scutellum, more coarctate metanotum and strongly punctate face, and in the longer petiole.

The above description is taken from Desvignes' type in Mus. Brit., which he tells us (*loc. cit.*) was already there in 1856; Stephens' collection was received in 1854 and this specimen is marked with his label. No doubt can remain that it belongs to Thomson's subgenus *Polytreres*, though the postpetiole but not petiole is laterally margined.

3. *sepulchralis*, Holmgr.

Mesoleius sepulchralis, Holmgr. Sv. Ak. Handl. 1876, p. 10, ♀; Bridg. Trans. Ent. Soc. 1854, p. 432; E. M. M. 1884, p. 228, ♂.

Head obviously constricted posteriorly, anteriorly triangular; clypeus discreted, basally narrow and subcoarctate, apically truncate and hardly margined; mandibles broad and prominent with subequal teeth, cheeks as long as their base; mouth of ♀ piceous, ♂ with face and clypeus and mandibles white. Antennae with the flagellum of both sexes centrally white-banded. Thorax not stout, black with white ♂ callosity before radices; mesonotum closely and finely punctate, with evanescent notauli; mesopleurae coriaceous punctate, with speculum much smoother though alutaceous; metathorax alutaceous, finely punctate with areae wanting and at most the pleural costae distinct. Scutellum black. Abdomen immaculate black; basal segment a little longer than hind coxae, not broad, gradually dilated apically, with neither sulcus nor carinae: second segment nitidulous with distinct thyridii, the following gradually becoming smoother; terebra apically truncate and not extending beyond anus. Legs somewhat slender, black with the anterior tarsi, tibiae and apices of femora testaceous in ♀, stramineous in ♂; ♂ with anterior coxae and all trochanters white; hind legs elongate with tarsi spinulose and their second to fourth or fifth joints white, ♂ with basal half of hind tibiae white. Wings with no areolet, stigma infusate testaceous, tegulae at least in ♀ piceous; nervellus subopposite. Length, 12 mm.

Very like *Euryproctus annulatus*, but with the areola and areolet wanting, the basal segment and terebra shorter, etc. The large size and distinctive colouration render it conspicuous in the present genus.

The female was described from Sweden, and Gaulle records it from France. Dr. J. A. Osborne in his Observations on the Parthenogenesis of *Zaraea fasciata* tells us (E. M. M. 1883, p. 147) that from this sawfly "Ichneumons, apparently of two species [probably the sexes of the present one], made their appearance as usual, on the average a good deal later than the saw-flies, so that the larvae of the latter might be grown enough to receive their eggs, a *Zaraea* larva nourishing only one ichneumon by which it is entirely consumed." At *lib. cit.* xx, 1884, p. 228, Bridgman identifies this parasite: "The ichneumons bred by Dr. Osborne from *Zaraea* are *Mesoleius sepulchralis*, new to Britain," introduced by him upon both sexes from the same source at Trans. Ent. Soc. 1884, p. 432. In a Postscript to his earlier paper, Osborne adds (E. M. M. xxi, 1884, p. 128) that of the three hundred and ten *Zaraea* cocoons, found by him at Milford near Letterkenny in Ireland, twenty-eight yielded ichneumons.

4. colon, Grav.

Tryphon colon, Gr. I. E. ii. 211, ♂; (?) Fonsc. Ann. Soc. Fr. 1849, p. 223, ♂. *Mesoleius colon*, Brisch. Schr. Phys. Ges. König. 1871, p. 83; Schr. Nat. Ges. Danz. 1878, p. 88, ♂. *M. (Barytarbus) colon*, Thoms. O. E. ix. 931; xvii. 1874, ♂ ♀.

Head posteriorly constricted; mouth flavous, ♂ face white; clypeus not apically emarginate, but with the margin depressed. Antennae sub-setaceous, nearly as long as the body, infusate with the twelfth to fifteenth joints entirely, and in at least ♂ scape beneath, white. Thorax black; metathorax not apically constricted, with neither areae nor costae. Scutellum and postscutellum stramineous. Abdomen a little longer than head and thorax, dilated towards apex, black with segments two to four red; first sometimes apically castaneous, second sometimes more or less broadly black discally and the fifth basally badious; sixth and seventh apically whitish; basal segment smooth, nearly thrice longer than broad and laterally immarginate. Legs somewhat slender; anterior with tibiae and tarsi pale flavous, femora fulvous, and both coxae and trochanters black and white marked; ♂ with anterior coxae below and trochanters white; hind legs long and stout, black with the femora except apically red, the spinulose tibiae basally dull white, and the third and fourth tarsal joints pale; hind calcaria extending beyond centre of their metatarsus; all the claws and their dark joints stout. Wings slightly clouded; stigma piceous, radix and tegulae flavous; areolet wanting, basal nervure oblique, parallel nervure emitted from far below centre of brachial cell; nervellus subopposite. Length, 7—8 mm.

This species stood as an insufficiently described *Tryphon* in our last catalogue, and was placed by Brischke in *Mesoleius*, as is noted by Bridgman (Trans. Ent. Soc. 1882, p. 158), but that the former recognised this species is rendered doubtful by his statement that the nervellus is unter der Mitte gebrochen; I think de Fonscolombe's male with distinctly punctured segments must belong to another species, since in this they are transversely alutaceous.

Very little is known of this conspicuous species, which occurs rarely in August in Silesia, Prussia, Sweden, and Gaille says, France. It has long stood in our List on the strength of the two males in Mus. Brit., found by Desvignes (Cat. 39), and must be rare with us, since the only other male I have seen was taken by Capron in Surrey about 1880.

5. pini, Bridg.

Mesoleius pini, Bridg. Trans. Ent. Soc. 1882, p. 156, ♂ ♀.

Head not buccate, slightly constricted posteriorly; mouth, apices of cheeks and the apically sinuate clypeus flavous. Antennae with mark on underside of scape flavous. Thorax with distinct notauli; pronotal margin or in ♀ most of prothorax, triangular humeral mesonotal marks, callosity at radices, propleurae, mesosternum except laterally and basal suture of mesopleurae, flavous; mesosternum laterally piceous or red; mesopleurae reticulate, sparsely and finely punctate; areola and petiolar area more distinct in ♀. Postscutellum and lateral basal margins of scutellum flavous, more broadly in ♀. Abdomen black and centrally subbadious, with all the segments except the first narrowly pale apically;

basal segment half as long again as broad and twice broader at apex than base, with carinae extending to just beyond centre in ♂ and obsolete in ♀; second segment in ♂ quadrate and in ♀ transverse; third longer than broad. Legs red with apices of hind femora, their tarsi entirely and tibiae except their badius base, infuscate; front coxae and a mark beneath the intermediate flavous, more broadly in ♀. Wings with stigma ferrugineous, tegulae flavous; areolet transverse and more or less distinctly petiolate; nervellus subopposite and intercepted a little below its centre. Length not indicated.

I suggest that Bridgman has transposed the sexes; he says it is most closely allied to *M. (Lamachus) silvarum*, Holmgr., from which it differs in having the mesopleurae flavous and the coxae flavous and red.

Both sexes were bred by Fletcher from cocoons of Scots *Lophyrus pini* about 1881, and no one has since noticed this parasite.

6. *brachyacanthus*, Parf.

Mesoleius brachyacanthus, Parf. E. M. M. xviii, 1881, p. 78, ♂; cf. Rep. Devon. Assoc. 1881, p. 275.

Head broader than thorax, with the mouth and palpi stramineous. Antennae ferrugineous beneath, "the basal joint very small, the second rather large, with an arched protuberance above." Thorax nitidulous black and very finely punctate; "mesothorax with two short, lateral concave spines; the metathorax with two raised lines crossing each other at nearly right angles, forming a St. Andrew's cross." Abdomen black and cylindrical, apically explanate, finely punctate with apices of all the segments pale testaceous, except the first which is basally flavous-spotted on either side. Legs testaceous or flavescent, with apices of the anterior tarsi nigrescent and intermediate coxae stramineous; hind legs with coxae and trochanters except apices of latter black, their femora piceous and internally infuscate before the stramineous base, their tibiae testaceous becoming apically nigrescent and tarsi, concolorous. Wings ample and subinfumate; stigma and nervures testaceous, basally paler; tegulae stramineous; areolet oblique and irregularly quadrate; expanse 9 mm. Length, 6 mm.

Parfitt possessed only two males of this species, which were taken about Exeter in 1879. They are probably now in the Exeter Municipal Museum: Bignell believed his collection was "in Exeter."

7. *vepretorum*, Grav.

Tryphon vepretorum, Gr. I. E. ii. 142, ♂ ♀. *Mesoleius vepretorum*, Holmgr. Sv. Ak. Handl. 1855, p. 133; loc. cit. 1876, p. 3, ♂ ♀; cf. Kriech. Ent. Nachr. 1897, p. 68. *M. (Otlophorus) vepretorum*, Thoms. O. E. xix. 2026, ♂ ♀.

Head as broad as thorax, finely punctulate and hardly constricted posteriorly; mouth red, face of ♀ black and of ♂ flavous; lower mandibular tooth much the longer; clypeus apically depressed throughout and slightly emarginate, with its centre subacutely produced. Antennae filiform, as long or slightly longer than body, infuscate with flagellum rufescent, and ♂ scape flavidous, beneath. Thorax black, of ♂ with callosity below radices and basal suture of mesopleurae pale; metathorax

distinctly short and convex, confluent punctate with griseous pubescence; areola and petiolar area laterally irregularly elevated. Scutellum black. Abdomen discally and ventrally entirely black; basal segment subdiluted apically, rugosely punctate and distinctly bicarinate; second and third rugosely punctate and the following somewhat shining. Legs red with only the hind tarsi, and apices of their tibiae broadly, black; the hind tibiae usually whitish basally or sometimes only internally towards the base; anterior coxae of ♀ often black-marked; front trochanters of ♂ whitish; hind calcaria hardly extending to centre of metatarsus; hind legs elongate. Wings with stigma dark testaceous, radix and tegulae stramineous in ♂ and dark in ♀; areolet petiolate, radial cell narrow and lanceolate; nervellus postfurcal, intercepted distinctly a little above its centre. Length, 10—15 mm.

It is allied to *Protarchus rufus* in the unusual position of the nervellus and regularly, strongly punctate mesopleurae but the abdomen is entirely black. This is our only species of Thomson's subgenus *Otlophorus*, characterised by having distinct areolet, the pleurae punctate with speculum glittering, metathorax areolated and the two basal segments rugosely or closely punctate, with the basal discally sulcate and the postpetiole margined. The strongly sculptured metathorax and basal segment are remarkable; in the indigenous ♀♀ the hind tibiae are black, testaceous-banded before their base.

Introduced by Desvignes on account of the specimens misrepresenting it in his collection, now in Mus. Brit. It is very rare with us and was not truly known to be indigenous till Dr. Capron took a female, now in my possession, at Shere about 1880; I also have another example of the same sex, kindly sent me by Miss Chawner, who found it recently in the New Forest. It occurs in Germany, Belgium, Sweden and France. Hartig is said to have raised it from *Nematus betularis* (*Pristiphora betulae*) and Dr. Giraud queries his breeding it (Ann. Soc. France, 1877, p. 407) from *Lophyrus polytomus*.

8. semicaligatus, Grav.

Ichneumon semicaligatus, Gr. Mem. Ac. Sc. Torin, 1820, p. 362, ♂. *Tryphon semicaligatus*, Gr. I. E. ii. 271; Ste. Ill. M. vii. 258, ♂. *Mesoleius semicaligatus*, Holmgr. Sv. Ak. Handl. 1855, p. 167; l. c. 1876, p. 43; Brisch. Schr. Nat. Ges. Danz. 1878, p. 86; *M. (Lagarotus) semicaligatus*, Thoms. O. E. xvii. 1881, ♂ ♀. Var. *Tryphon insolens*, Gr. I. E. ii. 274, cf. i. 691; Ste. Ill. M. vii. 258, ♂ ♀; *Mesoleius insolens*, Holmgr. Sv. Ak. Handl. 1855, p. 167; l. c. 1876, p. 44; *M. (Lagarotus) insolens*, excl. synonym., Thoms. O. E. xvii. 1881, ♂ ♀.

Head with vertex somewhat broad, hardly constricted posteriorly; cheeks subbuccate; mandibles elongate, somewhat stout and a little curved; clypeus not discreted, subtruncately depressed and hardly emarginate apically, with lateral foveae small; frons deplanate, dull and closely punctate; mouth and clypeus of ♀ piceous and of ♂, together (in form typ.) with the whole face, flavous. Antennae a little longer than body, apically subattenuate, with the first flagellar joint half as long again as second; scape of ♂ flavous-marked beneath. Thorax narrower than head, immaculate and not coarctate; notauli extremely superficial; metanotum rugulose throughout with central costae parallel; petiolar area short, semicircular, often basally incomplete and not reaching centre; mesosternum with speculum glittering and mesopleurae strongly rugose-coriaceous. Scutellum black. Abdomen subelongate, rarely nearly

entirely black but usually of ♂ centrally, of ♀ with third segment more or less broadly, deep red; basal segment twice longer than apically broad, laterally margined, with subcentral spiracles and distinct basal scrobes; terebra subexserted. Legs somewhat slender and elongate; red with coxae, trochanters, hind tarsi and occasionally femora and apices of their tibiae black; ♂ with the anterior coxae and trochanters partly flavidous; femora not stout, calcaria elongate, claws stout with unguiculi nearly half as long again as the fourth joint. Wings with stigma testaceous-flavous, ♂ with radix and tegulae whitish; basal nervure subvertical, areolet small and petiolate; nervellus subopposite and intercepted nearly in its centre. Length, 8—9 mm.

M. insolens has not hitherto been synonymised with this species, but it seems useless to attempt specific distinction between insects whose ♀ even Dr. Pfankuch says he cannot differentiate and the oculatissimus Thomson distinguished by no better characters than the generally larger size (*nec* Holmgr.), more strongly rugose-coriaceous pleurae, more evidently and sparsely punctate mesonotum, combined with black ♂ mouth and face, of *M. insolens*, of which he considered the entirely distinct *Tryphon petulans* and *T. evolans*, Grav., to be varieties. The characters of Thomson's subgenus *Lagarotus* appear hardly more than specific and I have, consequently, included them in my description of this species. The abdominal red colouration is very variable in extent, though always present; and the hind femora are not frequently black.

In grassy places on umbells in August; Germany, Austria, Belgium, Holland, Sweden, France, Italy; it has once been bred from the larva of an unnamed species of *Tenthredo* by Brischke (Schr. Phys. Ges. König. 1871, p. 82). This is one of the most abundant species of the genus with us, though only occurring in the autumn; I have taken it nearly every year since 1893, from 11th August to 10th October, on flowers of fennel, *Heracleum* and angelica, as well as by sweeping reeds and grasses, at Brandon, Bramford, Covehithe and Barnby and Oulton Broads, Holton, Monks' Soham and Henstead in Suffolk, and at Ryde in the Isle of Wight. It is recorded from the Isle of Man in 1869 (F. Walker), Holgate in 1881 (Wilson, Yorks. Nat. Union, 1882, p. 107), common in Norfolk (Bridgman), and Bishops Teignton in Devon (Bignell). It was first found here at Netley in Shropshire (Gravenhorst, who named a male now in Mus. Brit.); London (Stephens, in whose coll. is one from Darenth). I have seen it from Hunstanton, 30th Sept. (Brunetti), Felden, 30th Sept. (Piffard), Cadney in Sept. and South Leverton in Notts, 6th Oct. (Thornley), Lyndhurst in Sept. (Adams), Shere (Capron), Bungay on 3rd Oct. (Tuck), and Ousden 24th Sept. in Suffolk (Elliott), Whitby at end of August (Beaumont); Ballycastle, Co. Antrim in Sept., 1901 (Tomlin); Bonhill (Malloch), Park and Banchory in Kincardine in August (Elliott, E. M. M. 1910, p. 37). From its frequency and autumnal appearance I would suggest *Allantus arcuatus* as a probable host.

9. *fallax*, Holmgr.

Mesoleius fallax, Holmgr. Sv. Ak. Handl. 1855, p. 168; *lib. cit.* 1876, p. 42, ♂ ♀; Brisch. Schr. Phys. Ges. König. 1871, p. 82; Schr. Nat. Ges. Danz. 1878, p. 87, ♂ (*nec* Thoms.).

Head a little constricted posteriorly; mandibular teeth of equal length, clypeus apically depressed and truncate; mouth, clypeus and only ♂ face

flavious or fulvo-stramineous. Antennae with flagellum testaceous beneath. Thorax elongate, with flavious callosity before radices and notauli extending to apex; mesopleurae alutaceous, nitidulous and very finely punctate; metanotal areae incomplete. Abdomen more or less broadly red centrally; basal segment narrow and only slightly longer than hind coxae, with its basal fovea minute and discal sulcus evanescent, of ♀ rarely red. Legs red, with anterior coxae and trochanters partly black; hind legs black with their tibiae broadly red at the base. Wings with stigma flavious, radix and tegulae stramineous; areolet complete, distinctly petiolate; nervellus subopposite. Length, 8—9 mm.

I do not think this species is synonymous with Thomson's *M. (Alexeter) fallax* of O. E. xix. 2025, which he places next after *Mesoleptus ruficornis*, Grav. (O. E. xvii. 1885), since he says the face in both sexes is flavous and the conformation of both his species similis et affinis. At all events the British representatives are true *Mesoleii*, superficially resembling *M. semicaligatus* in the conformation of their basal segment.

This species was introduced as British by Bridgman (Trans. Ent. Soc. 1881, p. 164) on the strength of three males recorded by Dr. Capron from Shere in 1879 (Entom. 1880, p. 88); these are now in my collection and differ from *M. semicaligatus* in little but the pale anteradical callosity. Tuck sent me an analogous example on 7th October, 1899, taken by him in Norton Wood, near Bury St. Edmunds. Bignell records this species in 1898 from Laira, Plymouth and Bickleigh in Devon during June, July and August. Elsewhere it is known from Prussia, Sweden and France.

10. *erythrocerus*, Grav.

Tryphon erythrocerus, Gr. I. E. ii. 230, cf. i. 689; Steph. Ill. M. vii. 247, ♂ ♀. *Bassus erythrocerus*, Zett. Ins. Lap. i. 380, ♂. *Mesoleius erythrocerus*, Holmgr. Sv. Ak. Handl. 1855, p. 166; Brisch. Schr. Nat. Ges. Danz. 1892, p. 34; *M. (Lagarotus) erythrocerus*, Thoms. O. E. xvii. 1882, ♂ ♀.

Head with vertex broad, a little constricted posteriorly, cheeks hardly buccate, clypeus apically not depressed but centrally emarginate, discally deplanate with small foveae; ♂ with mouth and face flavous. Antennae black, apically dull red; scape of ♂ flavous beneath. Thorax oblong and immaculate; mesonotum nitidulous and finely punctulate with very obsolete notauli; metathorax apically constricted, rugulose with areae more or less distinct, the petiolar small, not reaching beyond the apical third, sometimes incomplete. Scutellum black. Abdomen oblong and laterally subparallel, black with second and third segments, except apex of latter, red; basal segment nearly twice longer than apically broad, apically subdilated, discally subrugosely punctate, laterally pilose, with basal scrobes deep; second somewhat shining, hardly shorter than broad and transversely convex; anus almost compressed, terebra black. Legs slender and black with the anterior tibiae, the front femora except basally and the intermediate apically, red; hind tibiae, except apically, red; ♂ with anterior trochanters and apices of coxae pale. Wings hyaline with stigma narrow and pale; ♂ tegulae pale; basal nervure a little oblique, areolet small and sometimes almost wanting; nervellus opposite and intercepted below centre. Length, 7—8 mm.

Pfankuch says that the above description agrees with the types and adds that the basal segment is broader and shorter than in *M. semicaligatus*, finely rugose-punctate, and flavous-red margined, the second and

third are entirely concolorous, the hind femora black with their extreme apices castaneous, the areola and petiolar area are distinct, the former narrow and apically acuminate, the latter broad with a central carina.

August on umbelliferous flowers in Germany; Lapland, Sweden, France and Belgium. Gravenhorst records it from Netley in Shropshire, and there is a male named by him in Mus. Brit., which is smaller and more slender than either Desvignes' or Stephens' specimens; in fact I am inclined to regard the latter, found in the London district in "June," with considerable suspicion. Marshall had specimens from Govilon in Monmouth and Bugbrooke in Northants; and I possess others taken by Beaumont at Harting in Sussex during early September, by Charbonnier at Lynmouth during the same month and by Elliott at Torphins on 3rd September. It has only occurred to me at Gritnam Wood in the New Forest on 27th August, 1901, and at Worlington in Suffolk on 28th August, 1906, on an angelica flower by the River Lark.

11. *rufolabris*, Zett.

Bassus (*Tryphon*) *rufolabris*, Zett. Ins. Lap i. 380, ♀. *Mesoleius rufolabris*, Holmgr. Sv. Ak. Handl. 1855, p. 171, cf. p. 381; l.c. 1876, p. 46; Brisch. Schr. Nat. Ges. Danz. 1878, p. 88; *M. (Scopesus) rufolabris*, Thoms. O. E. xix. 2029, ♂ ♀.

Head constricted posteriorly, with cheeks shorter than breadth of base of mandibles; clypeus and mouth of ♀ piceous or ferrugineous, of ♂ with clypeus and face flavidous. Antennae infusate with flagellum ferrugineous, and ♂ scape whitish, beneath. Thorax stout and immaculate or rarely in ♂ with pale callosity at radices; notauli short and not reaching apex; mesopleurae finely and alutaceously punctate, with striae before the not glabrous though shining speculum; petiolar area not extending beyond apical third of metathorax and generally complete. Scutellum black. Abdomen with three or four basal segments, except first of ♂, red; first segment explanate throughout, not laterally margined basally, with no discal carinae nor sulcus. Legs red with coxae and trochanters entirely in ♀ and basally in ♂, the hind tarsi with apices of their femora narrowly and of their tibiae broadly, nigrescent; claws and claw-joints stout. Wings with stigma dull stramineous, tegulae of ♂ whitish and of ♀ piceous or pale; areolet wanting, basal nervure subcontinuous; nervellus opposite and intercepted at its centre. Length, 7—10 mm.

Both sexes occasionally have the hind femora badius or nigrescent and the ♀ sometimes has the fourth segment apically black.

This species has been bred by Brischke from a *Tenthredo* larva in Prussia and occurs in France, Sweden and Lapland. Mr. E. A. Butler introduced it as British (E.M.M. 1881, p. 236) by the capture of two females at Wymondley in Herts, during August, 1880, and Bridgman says (Trans. Ent. Soc. 1881, p. 163) that they have a pale line beneath the radices; subsequently he adds (Trans. Norf. Soc. 1894, p. 626) that the species is common in Norfolk; Bignell took *M. "rufoleptus"* at Bickleigh in Devon on 3rd August, and Marshall found females at Cornworthy in Devon and Botusfleming in Cornwall. I possess a couple of both sexes from Surrey in Capron's collection and have myself swept females on 20th August, 1902, in Tuddenham Fen, Suffolk, and on 24th August, 1906,

at Burnham Thorpe in Norfolk. Desvignes, who seems to have known no author but Gravenhorst, had a long series of this species under *Tryphon longipes* and captured males in Essex.

12. *bicolor*, Grav.

Tryphon bicolor, Gr. I. E. ii. 326; Ste. Ill. M. vii. 264; Fonsc. Ann. Soc. Fr. 1849, p. 233, ♀; (?) Brisch. Schr. Nat. Ges. Danz. 1892, p. 33, ♀. *Mesoleius guttiger*, Holmgr. Sv. Ak. Handl. 1855, p. 171, ♀, cf. p. 381; l.c. 1876, p. 47, ♂ (? excl. ♀); *M. (Scopesus) guttiger*, Thoms. O. E. xix. 2030, ♂ ♀.

Head obviously constricted posteriorly; mouth, clypeus and ♂ face flavidous-white. Antennae with scape black, and flagellum ferrugineous, beneath. Thorax black, ♂ with broad triangular lateral mesonotal marks flavidous; mesopleurae alutaceous, with distinct longitudinal rugosities throughout. Abdomen with second to fourth, and in ♀ perhaps the first, segments red; basal segment not at all sulcate. Legs red with coxae and trochanters black; anterior femora clear flavous-red; hind legs black with the femora stout and the tibiae red, basally slightly infusate and apically black. Wings with stigma and tegulae dull stramineous. Length, 7—10 mm.

Similar to *M. rufolabris*, but stouter with the hind femora stouter and black, their tarsi subferrugineous, the speculum glittering and mesosternal sculpture finer.

Tryphon longipes and *T. bicolor* were erroneously synonymised by Desvignes in 1856, and the former consequently accorded priority by Marshall in our 1870 catalogue; Pfankuch has proved them to be distinct, however, and since it is *T. bicolor* that Stephens states to be British, *T. longipes* (antedated by *T. nigricollis*, Grav., to which it falls) must also be regarded as indigenous. Both belong to *Scopesus*, Thoms., and our present species is the *Mesoleius guttiger* of Holmgren and Thomson.

I have seen no females that I can distinguish from those of the last species, there are no records since 1835; and the single male in his collection named *M. guttiger* by Marshall is certainly referable to *M. rufolabris*. It is mentioned from Silesia by Gravenhorst, Aix in Provence by Fonscolombe and Sweden by Holmgren. Stephens says he took it near London in June and July; he, too, mixed the last species with it, but there is in his collection a single male with distinct triangular humeral marks, which seems correctly here placed.

13. *rufonotatus*, Holmgr.

Mesoleius rufonotatus, Holmgr. Sv. Ak. Handl. 1876, p. 31, ♂ ♀. *M. (Scopesus) rufonotatus*, Thoms. O. E. xix. 2033, ♂ ♀.

Head obviously constricted posteriorly; mouth and clypeus partly flavidous in ♀; mouth, clypeus, margin of the compressed cheeks and the face stramineous in ♂; clypeus apically rounded in the centre. Antennae apically pale ferrugineous beneath; ♂ scape stramineous-marked below. Thorax of ♂ with stramineous dot before radices; notauli hardly indicated; mesopleurae alutaceous, very finely punctate, shining; areolar costae evanescent. Abdomen with second and third segments entirely or partly castaneous; basal segment not longer than hind coxae, basal

fovea apically nearly closed, discal sulcus often indicated to beyond spiracles, apical angles obtuse or subrotundate. Legs normal; anterior red with coxae and trochanters black in ♀ and stramineous in ♂; hind ones black with femora except at both extremities red, and tibiae except apically pale; hind ♂ trochanters flavous, discally black-lined. Wings with no areolet; stigma dull stramineous and darker in ♂, radix stramineous, tegulae of ♂ concolourous and of ♀ subinfusate; nervellus antefurcal. Length, 7—8 mm.

This species varies in having the basal segment apically, the second and third entirely and fourth basally castaneous-red or the abdomen black with only the second and third segments discally or apically castaneous; the clypeus apically black or entirely pale; the hind femora red or with their base and apex black. Thomson suggests its synonymy with *M. subfasciatus*, Holmgr. 1855, p. 142, which is not recorded as British.

I do not know this insect, which is said to extend nearly throughout Europe. It was recorded from Earlham in Norfolk by Bridgman (Trans. Norf. Soc. 1894, p. 626), with no indication of its novelty as British.

14. *nigricollis*, Grav.

Tryphon nigricollis, Gr. I. E. ii. 234; Ste. Ill. M. vii. 248, ♂. *T. longipes*, Gr. I. E. ii. 319, ♂. *Bassus nigricollis*, Zett. Ins. Lap. i. 380, ♂ ♀. *Mesoleius nigricollis*, Holmgr. Sv. Ak. Handl. 1855, p. 176; l. c. 1876, p. 36; Brisch. Schr. Nat. Ges. Danz. 1878, p. 89; *M. (Scopesus) nigricollis*, Thoms. O. E. xix. 2032, ♂ ♀.

A black species with the mouth, lateral facial marks, the four basal segments and legs flavous; coxae and trochanters, hind femora and apices of their tibiae black; ♂ with whole face, scape beneath, all the trochanters and the anterior coxae pale flavous. Length, 9—11 mm.

Similar to *Mesoleius bicolor* in structure, but with the apical joint of the maxillary palpi longer than the penultimate, the hind tarsi flavous, the apical lateral angles of the clypeus indicated, with the distinct colouration of the abdomen and hind tarsi. The ♂ var. *longipes* has the basal segment black, and lateral mesonotal flavous spots. By no means unlike *Tryphon elongator*, though without frontal horn.

"Scarce: found in the north of England and Scotland, in July," says Stephens whose single male, with a female ex coll. Desvignes, in the British Museum are the only examples I have seen of this distinct species, which extends from Lapland, central and southern Sweden to Prussia, Gottingen and France.

15. *dorsalis*, Grav.

Tryphon dorsalis, Gr. I.E. ii. 226, ♂. *Mesoleius dorsalis*, Holmgr. Sv. Ak. Handl. 1855, p. 169; lib. cit. 1876, p. 32; Brisch. Schr. Nat. Ges. Danz. 1878, p. 88; lib. cit. 1891, p. 62; Thoms. O. E. xix. 2036; Pfank. Zeits. Hym.-Dip. 1906, p. 192, ♂ ♀.

Head short and a little constricted posteriorly; mouth, clypeus and in ♂ face but not cheeks, flavidous; clypeus simply rounded apically; eyes large. Antennae somewhat longer than body with scape of ♂ flavidous, and flagellum ferrugineous, beneath. Thorax alutaceously punctate and dull, with distinct notauli; dots before radices flavidous; mesopleurae

alutaceous and shining, speculum small and glittering; metanotal areae sharply defined, areola triangular and basally truncate, basal area small and quadrate, petiolar area hexagonal. Abdominal segments two and three more or less broadly red; the first two dull and rugosely punctate, with remainder nitidulous; basal segment as long as hind coxae, its basal fovea apically open, emitting two very distinct carinae extending slightly beyond spiracles. Anterior legs fulvous with coxae and trochanters of ♂ stramineous; hind ones red with their tibiae broadly whitish before their distinctly black base, and apically, like the tarsi and apices of their stout femora, nigrescent; anterior tarsi and all the calcaria white; claws weak. Wings with no areolet; stigma dull stramineous, radix and tegulae whitish; nervellus subopposite. Length, 6 mm.

Pfankuch's description of the ♂ type differs so little from that of Holmgren and Thomson, excepting in the apical clypeal structure, that I have considered them synonymous. The former in 1876 regarded his 1855 ♀ as misplaced, but that brought forward by Brischke (*lib. cit.* 1890, p. 104) appears correctly here placed.

It was introduced by Marshall in 1872, probably on account of a ♀, still in his collection, from Botusfleming in Cornwall; it appears very rare with us, since the only record is that of a ♀ at Earlham near Norwich, which Bridgman doubtfully referred to the present species. I possess a single ♂ in Capron's Surrey collection. It is distributed through Silesia, Prussia, Sweden and France.

16. *elegans* Parf.

Mesoleius elegans, Parf. Entomologists' Monthly Magazine, 1882, p. 273, ♀.

A black species, with hind tibiae and tarsi immaculate fulvous. Head posteriorly buccate and broader than thorax; clypeus, palpi and mandibles flavous. Antennae nearly as long as body, dull ferrugineous, with scape black and beneath flavous. Thorax subincrassate, black with lateral hamate mesonotal marks, a dot before and line below radices (and the sternum?), flavous; notauli distinct. Scutellum and postscutellum dull red, or sometimes black. Abdomen black with all the segments except the first fulvous-banded, and more broadly towards the anus, stramineous-margined; first segment gradually constricted basally, centrally convex, strongly bicarinate and deeply sulcate "half the length from the middle to the base." Legs including hind tibiae and tarsi fulvous; anterior coxae and trochanters stramineous, black at their extreme base; hind ones black, apically flavous. Wings ample, hyaline, with stigma and radius pale testaceous. Length, $7\frac{1}{2}$ mm. ♀ only.

The abdominal colouration is said to vary to a considerable extent. Parfit seems to have worked his species down to *M. amabilis*, in Holmgren's *Dispositio* of 1876, from which he says it differs in its coxal colouration and distinctly antefurcal nervellus.

"It appears to be widely and sparsely distributed, it has been taken by Mr. Bridgman, in the Norwich district, and by Mr. G. Bignell, near Plymouth, and I have taken two specimens near Exeter" (*l. c.*).

17. *hamulus*, Grav.

Tryphon hamulus, Gr. I. E. ii. 322; Ste. Ill. M. vii. 263, ♀. *Mesoleius hamulus*, Holmgr. Sv. Ak. Handl. 1855, p. 172, ♀; *lib. cit.* 1876, p. 24; Thoms. O. E. xix. 2038, ♂ ♀. *M. nobilis*, Holmgr. Sv. Ak. Handl. 1855, p. 178, ♂; Brisch. Schr. Nat. Ges. Danz. 1871, p. 84; *lib. cit.* 1878, p. 89, ♂ ♀.

A distinct-looking species, deplanate and very dull with the abdomen, except basally, clear red or castaneous and the hind tibiae, with their subincrassate tarsi, black. Head with the mouth and clypeus dull stramineous or whitish; centre of mandibles concolorous. Antennae black, a little longer than the body and apically slightly attenuate. Thorax discally deplanate, with a dot and a usually hamate line before radices stramineous; petiolar area laterally but not basally carinate, its sides forming an apically incomplete areola. Scutellum black and dull. Abdomen as long and broad as head and thorax, oblong and subsessile, red or castaneous, with the first segment alone or also base of the second more or less broadly black; first segment distinctly bicarinate basally, a little explanate apically, longer than broad with distinct spiracles before its centre; terebra black and slightly exerted. Legs not slender, the anterior red with trochanters and coxae black; the hind ones black with the femora, except sometimes at both base and apex red, and their tibiae rarely badious below towards their base. Wings hyaline with stigma and radius nigrescent; radix and tegulae whitish; areolet wanting and the basal nervure subcontinuous through the median. Length, 7—8 mm.

The ♂ differs in having the face with cheeks and mouth, the scape beneath, profuse thoracic markings and the legs flavous or stramineous, with only the hind coxae basally black.

It is distinct in the peculiar abdominal colour, mainly black ♀ legs and pale hamate ♀ mesonotum, while the ♂ has the thorax, including whole or sides of scutellum, almost mainly pale.

A wide-spread species through Austria, Germany, Sweden and France. The single ♀ in Stephens' collection, which I have seen, was found at Darenth Wood in June. There are two other females in Desvignes' collection, together with one that I do not consider more than a variety, differing in its immaculate thorax, black tegulae and slightly but distinctly postfurcal basal nervure. I possess two females of the same form, which I found on 27th and 31st May, on blackthorn leaves and by sweeping on a hot, sandy bank at 4.30 p.m. in the Bentley Woods near Ipswich, in 1900 and 1902; so distinct is this species from the usual appearance of *Mesoleius* that I at first mistook them for the ♀ ♀ of *Euceros*, from which the simple claws separate it. Records are from Lynn in Norfolk (Atmore), Norwich (Bridgman), Maker in Devon on 5th June (Bignell) and St. Albans (Marshall, Ent. Ann. 1874, p. 143).

18. *ignavus*, Holmgr.

Mesoleius ignavus, Holmgr. Sv. Ak. Handl. 1855, p. 174, cf. p. 381; *lib. cit.* 1876, p. 32; Thoms. O. E. xix. 2039, ♂ ♀.

A narrow, somewhat slender species. Head obviously constricted posteriorly; mouth, clypeus, face except sometimes partly in ♀, and apices of ♂ cheeks, flavous; clypeus subtruncate or slightly emarginate.

its margin laterally somewhat deplanate and centre subproduced. Antennae with flagellum ferrugineous, and in ♂ scape flavidous, beneath. Thorax sometimes in ♂ with mesonotal pale marks before radices; notauli apically wanting; mesopleurae alutaceous, more shining and finely sculptured in ♂; longitudinal metathoracic costae distinct, areola complete. Abdomen with second to fourth segments red, the second in ♂ basally black-marked; basal segment rather longer than hind coxae, with basal fovea narrowly open apically and emitting two stout or obsolete carinae. Anterior legs red, with coxae and base of trochanters black in ♀ and stramineous in ♂; hind legs black with femora except rarely at their apices, and centre of tibiae broadly, red. Wings with no areolet, stigma infuscate; radix and tegulae stramineous, the latter basally black-dotted; nervellus a little antefurcal. Length, 7 mm.

Allied to *M. hamulus* in the black ♀ coxae and trochanters, the pale ventral plica and distinct cheeks, but especially in the ample wings with subelongate radial cell, and the centrally subnasute clypeus.

This species occurs in damp meadows in the middle of July in central and northern Sweden; Gaulle records it from France. Dalla Torre credits Brischke with raising this parasite from a species of *Nematus*, but I find no mention of it from Germany. It is recorded from Norwich by Bridgman, who first recognised it as British (Trans. Ent. Soc. 1882, p. 156).

19. *tenuiventris*, Holmgr.

Mesoleius tenuiventris, Holmgr. Sv. Ak. Handl. 1856, p. 382, ♂; Thoms. O. E. xix. 2042, ♂ ♀. *M. erythrogaster*, Holmgr. Sv. Ak. Handl. 1876, p. 44, ♀.

An elongate, black species with abdomen mainly clear red and ♀ face pale. Head very distinctly constricted posteriorly with the mouth, clypeus, face except in ♀ centrally, and the ♂ cheeks, flavous; cheeks not short; clypeus apically broadly emarginate and centrally subtuberculate. Antennae as long as body and apically subpilose, black with the scape flavidous, and flagellum often ferrugineous, beneath. Thorax elongate, subelevated and somewhat stout; mesonotum nitidulous and not alutaceous, notauli distinct and elongate; callosities before and beneath radices, and in ♂ lateral mesonotal and mesosternal marks, flavous; mesopleurae strongly alutaceous and hardly shining; carinae of petiolar area usually complete. Scutellum black, of ♀ sometimes apically rosy. Abdomen fulvous above and flavous beneath, its extreme base and apex black-marked or rarely the pygidium and basal half of first segment black; basal segment somewhat narrow, longer than hind coxae, its basal fovea emitting two carinulae, postpetiole longer than broad, a little dilated apically and apically pale; second not transverse. Legs somewhat slender and fulvous, with anterior coxae and trochanters flavous; hind coxae of ♀ internally black-marked basally; their trochanters apically flavous; tarsi slender. Wings with nervures pale, stigma dull stramineous, radix and tegulae flavidous; areolet wanting; nervellus opposite and intercepted in centre. Length, 7 mm.

Its elongate form resembles *M. leptogaster*, but the pale ♀ face is distinct.

We have but small claim to this species at present as British—though its record by Thomson (*loc. cit.*) from Germany, Sweden and France

renders its occurrence probable—since a single ♂ was taken by Bridgman at Brundall near Norwich and doubtfully associated by him with Holmgren's female *M. erythrogaster* (Trans. Norfolk Nat. Soc. 1894, p. 626), before its synonymy by Thomson appeared in 1895.

20. *armillatorius*, Grav.

Ichneumon armillatorius, Gr. Vergl. Ubers. 1807, p. 262; Nov. Act. Ac. 1818, p. 285, ♂ (*nec* Thunb.). *Tryphon armillatorius*, Gr. I. E. ii. 182, ♂, excl. varr. 1 et 3; Ste. Ill. M. vii. 241; Fonsc. Ann. Soc. Fr. 1849, p. 221, ♂. *T. luteifrons*, Gr. I. E. ii. 215; Ste. Ill. M. vii. 246, ♀. *Mesoleius armillatorius*, Holmgr. Sv. Ak. Handl. 1855, p. 155; *lib. cit.* 1876, p. 41; Gir. Ann. Soc. Fr. 1871, p. 386; Thoms. O. E. xix. 2043, ♂ ♀.

Head a little constricted posteriorly; clypeus apically depressed, very slightly emarginate, with the actual margin entire; mouth, clypeus, cheeks and face stramineous. Antennae with scape stramineous, and flagellum ferrugineous, beneath. Thorax with callosity before and line beneath radix, in ♂ also pronotum, hamate mesonotal marks, sutures of pleurae, irregular pectoral marks and very rarely the notauli, stramineous; mesopleurae finely alutaceous and somewhat shining; areola usually complete, its carinae sometimes obsolete, and petiolar area distinct. Scutellum and postscutellum stramineous. Abdomen more or less broadly red centrally, ♀ venter stramineous; basal segment slightly longer than hind coxae with its basal fovea apically open and emitting two carinulae, apical angles obtusely rounded; second finely alutaceous with very distinct thyridii. Legs red and in ♂ paler; anterior coxae and trochanters stramineous; hind tarsi, with apices of their pale tibiae, nigrescent. Wings with stigma piceous or infusate, radix and tegulae stramineous; areolet rarely complete, external nervure usually wanting; nervellus ante-furcal. Length, circa 7 mm.

The centrally broadly red abdomen and flavous scutellum render this a pretty insect.

It occurs throughout northern and central Europe from June to October; and is said to have been bred from *Nematus* (*Macrophya*) *ribis* and *Lyda pyri* by Goureau (Dours' Cat. 53, *cf.* E. M. M. 1878, p. 266), from *Athalia spinarum*, *Blennocampa pubescens*, *B. melanocephala* and *Nematus salicis* by Giraud (Ann. Soc. Fr. 1877, p. 407), and from *Dineura verna* by Klug. With us it is not uncommon and seems to put in two well defined appearances during the year, since I have taken it from 29th May to 6th July and from 26th August to 17th September with some regularity, usually in marshy places but also in woods, where the birch bushes probably have some attraction for it, though it is occasionally swept from reeds and grass; not rarely it may be seen upon the flower heads of *Angelica sylvestris* and *Alisma plantago-aquatica*. It is recorded from Darenth Wood (Stephens), Guestling near Hastings in 1889 (Bloomfield), Brundall near Norwich (Bridgman), and Horrabridge in the middle of June (Bignell). I have seen it from Lasingham in Yorks, St. Albans, Nunton in Wilts (Marshall), and the New Forest (Miss Chawner); and taken it at Foxhall, Brandon staunch, Bramford, Bentley Woods, and frequently in Tuddenham Fen in Suffolk, as well as in Wicken Fen in Cambs. and Roydon Fen near Diss, Norfolk.

21. *scapularis*, Steph.

Tryphon scapularis, Ste. Ill. M. vii. 257, ♀. *Mesoleius leptogaster*, Holmgr. Sv. Ak. Handl. 1855, p. 175, excl. ♂. *M. difformis*, Holmgr. lib. cit. 1876, p. 24, ♀; Thoms. O.E. xix. 2044, ♂ ♀.

Head very distinctly constricted posteriorly; mouth, clypeus, apices of cheeks and the whole face of both sexes, flavous; clypeus slightly emarginate, with apex laterally depressed and inconspicuous, centrally subinterrupted. Antennae as long as body, ferrugineous, basally paler with the scape black, whitish beneath. Thorax black with pronotal margin, subhamate lateral mesonotal marks, a dot before and line below radices, flavous; notauli fine, mesopleurae alutaceous; areola elongate with its costae fine and subevanescent. Scutellum black. Abdomen with segments two to four red, the second and fourth black-marked, usually with apex of second, whole of third and disc of fourth red; venter entirely flavidous; basal segment a little longer than hind coxae, with sulcus obsolete and basal fovea apically open. Legs normal, pale red with coxae and trochanters stramineous; hind coxae of ♀ entirely black basally, with their tarsi and apices of their tibiae in both sexes nigrescent; apices of hind femora hardly infusate. Wings with stigma dull stramineous, radix and tegulae flavous; areolet wanting, fenestrae confluent; nervellus oblique and elongately antefurcal. Length, 6—7 mm.

Since Holmgren incorrectly associated the sexes of different species in 1855 and renamed the female in 1876, it appears extremely doubtful if the true *M. leptogaster* be British, especially as the only indigenous mention of the name is preceded by a query in Bridgman's list of the Ichneumonidae of Norfolk and was not considered by him sufficiently satisfactory to bring forward with his other "Additions" in Trans. Ent. Soc.

The exclusively Swedish *M. difformis* was mentioned as British with some degree of doubt by Bridgman (Trans. Ent. Soc. 1882, p. 156) because in the example in question, bred by Fletcher probably at Worcester from *Cladius Brullaei*, the second recurrent nervure was not interstitial. Later, however, he records it (Trans. Norf. Soc. 1894, p. 626) with no hesitancy from Norwich and Salhouse in Norfolk. Giraud bred *M. leptogaster* from "insectes, dans *Rubus*." I have a female and two males of this species, taken at Felden in Herts by Piffard and Nunton in Wilts by Marshall, which agree *ad amussim* with Stephens' type of *Tryphon scapularis*, found near London in June and still in fine condition in the National Collection.

22. *molestus*, Holmgr.

Mesoleius molestus, Holmgr. Sv. Ak. Handl. 1855, p. 147; Thoms. O.E. xix. 2045, ♂ ♀.

A black species with the face except a central ♀ vitta, cheeks, mouth and hamate lateral mesonotal marks, stramineous. Abdomen of ♀ with the third to seventh segments fulvidous, the third to fifth laterally nigrescent marked; of ♂ with the second to seventh segments stramineous-margined, the third and fourth pale testaceous, laterally black-marked with sides of remainder black. Legs fulvous, basally whitish, with basal half of hind coxae black. Length, 6 mm.

Like *M. scapularis* in its oblique nervellus, confluent fenestrae, the clypeal

colour and structure, but distinct in the colouration of the coxae and abdomen, the hamate humeral marks, the anteriorly pale-marked mesosternum of both sexes, and the colouration of the ♂ abdomen. Probably little more than a variety of the last species; it was thought by Holmgren in 1876 to have been incorrectly referred to the present genus.

Holmgren originally described both sexes with pale face from Kinnekulle in West Gothland; in 1876 he thought it erroneously placed in this genus, though it is difficult to tell to which other of his it could be referred; in 1895 Thomson leaves it in *Mesoleius*, retaining the pale-faced sexes differing only in the black ♀ vitta, and gives Päljö as locality. Our females have the mouth and clypeus pale but the face black, yet I have no doubt they belong to the same species which appears variable in punctuation, size and extent of the black abdominal markings but always specifically characteristic in the elongate antennae, thorax and abdomen with its fairly constant black lateral markings which doubtless caused Marshall to refer the specimens he took at Govilon and Cornworthy to *Tryphon lateralis*, Grav. It was introduced with some hesitation by Bridgman (Trans. Ent. Soc. 1882, p. 156) on account of the central interception of the nervellus and I have a black-faced ♀, sent by Bignell from Devon, so named with a query by him. All the indigenous examples have the nervellus centrally intercepted, so that perhaps his query should be perpetuated in our fauna; but I do not find the ♂, named by him from Shere, in Capron's collection. Bignell, however, recorded on Bridgman's authority with no hesitation this species from Bickleigh on 20th August and I have seen twenty examples. Three of these were unnamed in Desvignes' collection, others taken by Dalglish at Gourrock in June, 1899, by Tomlin at Cannock Chase in June, 1904, by Beaumont at Courten in Ireland early in September, 1893, by Piffard at Felden and the remainder have fallen to my own net, always in the most swampy situations and usually among reeds, over which I have seen this parasite flying with evident interest in the insects frequenting them, and it is occasionally on the flower tables of *Angelica*. Like *M. armillatorius*, there seem to be two emergences from 14th to 27th June and from 9th to 25th September, during which two months alone I have seen it at Pakenham Fen, Foxhall, Henstead and on the banks of the Waveney at Beccles, of the Little Ouse at Brandon, of the Gipping at Ipswich and of the Lark at Mildenhall; it also occurs at Matley Bog in the New Forest.

23. *aulicus*, Grav.

Tryphon aulicus, Gr. I. E. ii. 173; Ste. Ill. M. vii. 239; Fonsc. Ann. Soc. Fr. 1849, p. 220, excl. ♂. *T. armillatorius*, var. 3, Gr. I. E. ii. 184, ♂. *Mesoleius aulicus*, Holmgr. Sv. Ak. Handl. 1855, p. 134; loc. cit. 1876, p. 9; Voll. Pinac. xxiii, fig. 2; Thoms. O. E. xix. 2058, ♂ ♀. Var. *M. dubius*, Holmgr. Sv. Ak. Handl. 1855, p. 134 (nec 1876), ♀.

Head black with the mouth, clypeus and ♂ face flavidous; clypeus apically emarginate, more strongly sinuate in ♂. Antennae with the ♂ scape flavidous beneath. Thorax black with pronotal margin, and ♂ sternum and callosities before radix, flavidous; mesopleurae alutaceous and very finely punctate, with speculum always quite dull; areola feebly indicated or entirely wanting; petiolar area laterally strong. Scutellum apically or entirely flavidous, apically red or black throughout. Abdomen of ♀ with segmental margins above, of ♂ with the segments more or

less discally, testaceous; the two basal segments alutaceous and the first as long as hind coxae, with distinct basal fovea, but the discal sulcus and carinae obsolete or wanting. Legs red with the hind tarsi, tibiae and in ♀ apices of their femora, black; hind tibiae spinulose and broadly white-banded before their base. Wings with tegulae flavidous, areolet wanting or triangular with outer nervure weak; recurrent nervure uni- or bi-fenestrate. Length, 6—9 mm.

Holmgren's original *M. dubius* is said by Thomson to be distinct from that of 1876 and to be a ♀ variety of the present species with the venter basally white; Pfankuch tells us Gravenhorst's var. 1 of *M. aulicus* is analogous. The dull speculum is characteristic of this and the next species. Much mixed with *M. armillatorius* in our collections, but at once known by the alutaceous speculum and pale testaceous, never red, abdominal markings.

A common species throughout nearly the whole of Europe; bred in Prussia by Brischke from larvae of *Nematus fulvus* (Schr. Phys. Ges. König. 1871, p. 73) and of *Selandria ovata* (Schr. Nat. Ges. Danz. 1878, p. 77), from *Cladius viminalis* on 22nd May (Ratz. Ichn. d. Forst. iii. 124) and from *Lophyrus pini* (Voll.).* With us it is frequent, especially in woods where it is usually taken by a swinging net without being seen about the end of May, but more often in August, when it sometimes occurs on reeds and flowers of *Heracleum sphondylium*, near willows. Combe Wood (Stephens' coll.), Bishops Teington, Barnstaple, Cornworthy, Nunton and Botusfleming (Marshall), emerged from willow stump at York (Wilson, Trans. Yorks. Union, 1882, p. 107), Norwich (Bridgman). I possess it from Ewhurst in Sussex (Esam), Cuslop in Hereford (Yerbury), Pannal near Harrogate in 1867 (Roebuck), Shere (Capron), and Greenings in Surrey (Saunders), Felden (Piffard), Oxshott on 20th July (Beaumont) and Plymouth (Bignell). It is especially common in the New Forest, where I have found it at Hinchelsea, Denny Wood, Pondhead, Hurst Hill and Lyndhurst; in Suffolk it has occurred only in Tuddenham Fen, very rarely in the Bentley Woods and at Foxhall; and in Norfolk at Metton near Cromer.

24. *axillaris*, Steph.

Tryphon axillaris, Steph. Illus. Mandib. vii. 256, ♀. *Mesoleius amabilis*, Holmgr. Sv. Ak. Handl. 1855, p. 144, cf. p. 380; *lib. cit.* 1876, p. 20, ♀; Thoms. O.E. xix. 2071, ♂ ♀.

Head with the mouth; face except a central ♀ vitta, clypeus, humeral marks, and ♂ cheeks and sternum, flavous; apices of the abdominal segments two to seven gradually more broadly pale testaceous, the third and rarely fourth with a central concolourous plaga; legs pale fulvous with

* In The Journal of Economic Biology, 1910, pp. 92-94, Mr. Joseph Mangan of the Manchester University makes "Some Remarks on the Parasites of the large larch sawfly, *Nematus Erichsonii*," in which he considers it evident that a more or less complete destruction of the larches, such as has taken place in certain extensive plantations, will become general in the Lake District, if the parasitic enemies of the sawfly fail to increase sufficiently to cope with the attack. "By far the most important parasite of *Nematus erichsonii* as yet recorded in this country is the ichneumon *Mesoleius aulicus*, Grav." *Microcryptus labralis* was also bred (I suggest hyperparasitically through the *Mesoleius*) from the sawfly cocoons. Now, *Holcoenene Erichsoni*, Htg., was confirmed as British by the Rev. F. D. Morice so lately as 1908 (E. M. M. p. 101) and no parasites have previously been mentioned from it, but *Heromalus Klugi* by Ratzeburg and *Perilissus lutescens* by Brischke, of both of which Mr. Mangan appears ignorant. Both Dr. Gordon Hewitt and Mr. Halbert of the Dublin Museum have given me examples of the *Mesoleius* bred from the Cumberland *Holcoenene* and they are certainly distinct from, though closely allied to, *M. aulicus*, Grav. I do not recognise the species, and have not met with it elsewhere; it may be new, and I hope to refer again to it at some future time.

the anterior coxae and trochanters, and apex of hind trochanters, stramineous; hind coxae, except apically in ♂, and base of their trochanters black. Length, 7 mm.

At once known from *M. aulicus*, which the mesopleural sculpture and abdominal colour resemble, by the black hind coxae, base of their trochanters, central ♀ face and usually whole of the scutellum, by the immaculate fulvous hind tibiae and but slightly infusate hind tarsi. I have examined Stephens' type in Mus. Brit. and find it agrees *ad amussim* with Holmgren's description.

"Taken in June near London" (Stephens); I possess a second example, captured by Marshall at Govilon on the River Usk near Abergavenny in Monmouth. Elsewhere it is only known from Sweden.

25. *caligatus*, Grav.

Tryphon sylvestris, Gr. I. E. ii. 138, ♂ (part.). *T. caligatus*, Gr. I. E. ii. 170; Ste. Ill. M. vii. 233; Fonsc. Ann. Soc. Fr. 1849, p. 222, ♀. *Mesoleius caligatus*, Holmgr. Sv. Ak. Handl. 1855, p. 135; Brisch. Schr. Phys. Ges. König. 1871, p. 73, ♀; Holmgr. l.c. 1876, p. 25, excl. ♂; Voll. Pinac. xxiii, fig. 3; Thoms. O.E. xix. 2059, ♂ ♀.

A stout species. Head hardly constricted posteriorly; mouth and clypeus testaceous, with the latter apically subtridentate and centrally produced. Antennae infusate and ferrugineous beneath, or red with the two first and base of third joints black, rufescent below. Thorax with callosities before and usually beneath radices red; notauli distinct; mesosternum laterally smooth above, with speculum glabrous; metanotum short and shining with stout costae, areola centrally somewhat coarctate and subsulcate towards its apex; petiolar area extending to centre, subsemicircular and centrally carinulate. Scutellum nearly always discally or apically, and the postscutellum, red. Abdomen and its ventral plica entirely black; basal segment laterally margined and discally carinate to beyond spiracles; terebra slightly exerted. Legs red with the hind tibiae and tarsi black, the former before their base whitish or obsoletely ferrugineous; hind legs subincrassate and subelongate, with stout tarsi. Wings often slightly infumate with stigma infusate, radix and tegulae red; areolet wanting; nervellus subopposite and intercepted nearly in its centre. Length, 9—12 mm.

This species is similar to *M. virgultorum* and *M. vepretorum* in size and outline but with the body larger and stouter, the first segment less contracted basally, and areolet wanting; it is also very like *M. aulicus* of which Gravenhorst thought the ♀ possibly little more than a variety. *Tryphon sylvestris*, Grav., has always been an enigma to systematists; but Pfankuch cleared the matter up in 1906 by finding Gravenhorst's specimens to consist of two male *Lampronota melancholica* and a single male of the present species, which must stand. The *Mesoleius sylvestris*, named by Bridgman and recorded by me from Guestling in the Victoria History of Sussex, is a ♂ *Lampronota caligata*, Grav.

This species has been but little understood both here and abroad. Gravenhorst distinctly gives the minimum length at about 9 mm. and maximum at about 11 mm.; Holmgren says it varies only from 7—9 mm., which seems to have caused considerable confusion in our collections, especially as the species is so rare with us that examples do not become

easily available. On the Continent it seems to range through Germany, where Brischke has bred it from larvae of *Nematus fulvus* and *Cladius viminalis*, Sweden, Holland and France. Bignell alone recorded it with us; he took it once at Horrabridge in Devon on 16th June; but the only example I have seen is a magnificent ♀ of the maximum size in Mus. Brit. ex. coll. Desvignes.

26 *variegatus*, Jurine.

Anomalon variegatum, Jur. Nouv. Méth. 1807, 116, pl. viii, fig. 2; Gr. I. E. iii. 874, ♀. *Tryphon sanguinicollis*, Gr. I. E. ii. 187; Ste. Ill. M. vii. 242; Ratz. Ichn. d. Forst. iii. 128, ♂ ♀. *Mesoleius sanguinicollis*, Holmgr. Sv. Ak. Handl. 1854, p. 71, ♀; *lib. cit.* 1855, p. 137; *l.c.* 1876, p. 13; Gir. Verb. z.-b. Ges. 1863, p. 1286; Voll. Pinac. pl. xxiii, fig. 6; Thoms. O. E. xix. 2073, ♂ ♀. *M. variegatus*, Kriech. Mitt. Schw. Ges. 1882, p. 391; Pfank. Zeits. Hym.-Dip. 1906, p. 219.

A somewhat coarctate species. Head posteriorly narrow; mouth and clypeus whitish, the latter apically subrounded in its centre, with lateral angles distinct. Thorax black, with a callosity before radices whitish; notauli distinct; mesosternum laterally smooth above and obsoletely punctate below; metanotal costae distinct, with petiolar area large, occupying apical third and centrally carinate. Abdomen black with the segments narrowly white-margined, more broadly laterally; basal segment somewhat broad and long, sulcate; venter whitish throughout. Legs red, with all the coxae pale; hind tarsi and tibiae black, the latter internally whitish basally. Wings with stigma infusate, tegulae whitish; nervellus antefurcal. Length, 6—9 mm.

A variable species, with the thorax generally broadly red; the ♀ sometimes has the cheeks white-marked, the mesonotum and scutellum not rarely entirely red (as figured by Jurine and Voll.) or with humeral and lateral-scutellar marks whitish; occasionally the whole mesonotum is nearly entirely black; the ♂ may have the face and lower frontal orbits, with the anterior coxae and trochanters, white and the mesosternum tricoloured. The synonymy of Jurine's names was worked out in their "Ueber die Typen zu Jurine's Werk" by Frei-Gessner, Kohl and Kriechbaumer in 1882.

It differs from *M. formosus* in its emarginate clypeus and stouter conformation. In Scandinavia the male is said to be much the scarcer sex, which appears also true of Britain.

On the Continent it is recorded from Silesia, Austria, Lapland, Sweden, France, Holland, and Belgium in May, July and September. It has frequently been bred: from *Nematus* (*Pteronius*) *salicis* and raised by Brischke on 20th April from *Nematus* galls on wild rose, says Ratzeburg; Vollenhoven saw it emerge from a *Nematus* gall on willow, doubtfully referred to *Pontania gallicola* by Gaulle; Giraud in 1877 again bred it from *Nematus salicis*, adding the fossor *Cemonus* (*Pemphredon*) *unicolor* and the Dipterno *Lipara lucens*, a very improbable host, as is remarked by Fitch (Entom. 1880, p. 257), in recording the present species bred by Weston and himself in July, 1879, from galls of *Cynips Kollari*, in which "it was probably parasitic on *Harpiphorus lepidus*." For the third or fourth time, Bignell (Entom. 1885, p. 152) bred it from sawfly galls on *Salix caprea* on 10th September, 1884, in Devon. Dalla Torre credits Westwood with the statement that it preys upon *Nematus gallicola*.

"Scarce: found in June at Darenth wood" (Stephens); Glanvilles Wootton, Dorset (Dale); Cromer and Brundall, Norfolk (Bridgman); examples in the British Museum are from Marsham's, Stephens', Desvignes' and Marshall's collections, the last (labelled, *M. formosus*) is from Bishops Teignton. I have seen it from Sutton, near Birmingham, 1896 (Bradley), and August, 1899 (Wainwright); bred at Barton on Humber in Lincs., May, 1907 (G. W. Mason); Guestling near Hastings in 1891 (Bloomfield); and a Lyndhurst garden on 2nd June, 1902 (Adams). In my own limited experience it has always been beaten from young birch bushes in woods, in which situation it has occurred to me at Reydon near Southwold on 4th June, at Bentley in the middle of June, and somewhat freely on 26th September, 1907, at Tuddenham in Suffolk.

27. *segmentator*, Holmgr.

Mesoleius segmentator, Holmgr. Sv. Ak. Handl. 1855, p. 165, ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 85; Thoms. O. E. xix. 2049, ♂ ♀. *M. solitarius*, Holmgr. Sv. Ak. Handl. 1876, p. 14, ♂ ♀.

Head almost broader than thorax, with vertex broad and not constricted posteriorly; clypeus short, mandibles stout and apically constricted; mouth, clypeus, cheeks and a small quadrate mark above either side of clypeus pale testaceous; ♂ with face flavous, usually trilobed with black above. Antennae nearly as long as body, apically subattenuate and hardly pilose, basally flavidous beneath; of ♂ shorter, with flagellum black. Thorax elongate and not gibbous; mesonotum shining, not alutaceous, obsoletely punctate, usually with hamate humeral marks flavous; mesosternum centrally rosy or sometimes flavescent, laterally sparsely and strongly punctate; metathorax narrow, with petiolar area nearly circular and not extending beyond apical third. Scutellum laterally stramineous, rarely immaculate. Abdomen longer than head and thorax with segments three to seven, apically whitish, of ♀ gradually compressed, of ♂ parallel-sided; basal segment elongate and broad with discal sulcus central, somewhat deep and extending beyond spiracles; second quadrate, very finely alutaceous, somewhat shining; third quadrate; and venter, with terebra, stramineous. Legs somewhat stout, pale with the hind tarsi infusate, a little shorter than their tibiae, spinulose beneath, and in ♂ longer; claws somewhat stout. Wings hyaline, stigma black and emitting radius before its centre, areolet usually wanting; lower basal nervure postfurcal. Length, 6—8 mm.

The areolet is sometimes complete or subcomplete. Distinct in its mesesternal puncturation from *M. sternoxyanthus*, with which it agrees in its centrally broadly rounded clypeal apex with distinct lateral angles, somewhat distinct notauli and metathoracic areae, oblique nervellus, stoutish legs with calcaria not extending to centre of metatarsus, and partly pale ♀ face.

This species occurs in France, Sweden, and Prussia, where Brischke bred it from larvae of *Nematus perspicillaris* (*Pteronius dimidiatus*) and *P. salicis*, so it was very likely to be found with us. A single male with no locality (Trans. Ent. Soc. 1881, p. 163) is recorded by Bridgman.

28. *haematodes*, Grav.

Tryphon haematodes, Gr. I. E. ii. 177; Ste. Ill. M. vii. 240, ♀. *Mesoleius haematodes*, Holmgr. Sv. Ak. Handl. 1855, p. 137; *lib. cit.* 1876, p. 16; Voll. Pinac. xxiii, fig. 7; Brisch. Schr. Nat. Ges. Danz. 1878, p. 78; Thoms., O. E. xix. 2075, ♂ ♀.

Head posteriorly narrow; mouth and clypeus, and in ♂ also face, cheeks and nearly whole of frontal orbits, whitish; clypeus convex, punctate, apically rounded centrally, with lateral angles more distinct in ♀. Thorax with humeral marks and lines below radices whitish; notauli inconspicuous and apically obsolete; mesopleurae subrugosely alutaceous; ♂ mesosternum whitish; petiolar area distinct but not occupying apical third. Scutellum red or laterally whitish. Abdomen black with segments two to seven very narrowly white-margined apically, ♂ sometimes with the third centrally white-marked; basal segment twice longer than apically broad, with distinct basal scrobes and the discal sulcus narrow and slender or subobsolete; ventral plica whitish. Legs somewhat slender, red; hind tarsi and apices of their tibiae black; hind tarsi slender, their tibiae nigrescent, becoming basally paler, sometimes externally infusate throughout, never at all white-marked; ♂ with anterior coxae and trochanters, and apices of hind trochanters, flavescent or whitish. Wings with tegulae and stigma pale; areolet obsolete; nervellus antefurcal. Length, 7—8 mm.

The ♀ face occasionally has two white vittae, its scutellum either red or laterally pale, and the mesosternum entirely black or laterally rosy-marked. Vollenhoven's figure of this species, with pale hind tibiae is probably wrongly named, since one of its characteristics is the almost entirely nigrescent hind tibiae; another is the pale ♂ frontal orbits.

It is said to extend throughout nearly all Europe, but has not been bred. Stephens' examples from the London district are lost, though there is an unnamed female from his collection in Mus. Brit.; with a second from Lasingham in Yorks, correctly named by Desvignes. Bridgman records it from Heigham osier carr, near Norwich, and Bignell captured it at Bickleigh on 21st August. It is certainly rare with us, and I possess but a single female, which Tuck sent me from Finborough Park, in Suffolk, taken on *Angelica* flowers, on 24th September.

29. *maculicollis*, Steph.

Tryphon maculicollis, Ste. Ill. M. vii. 234, ♀. *Mesoleius vigens*, Holmgr. Sv. Ak. Handl. 1855, p. 142; *lib. cit.* 1876, p. 16; Thoms. O. E. xix. 2076, ♀. *M. parvus*, Holmgr. Sv. Ak. Handl. 1855, p. 142; *lib. cit.* 1876, p. 17, ♀.

A black species with the mouth, clypeus, pronotal callosity, tegulae, apical margins of the abdominal segments narrowly, and the ventral plica, whitish. Legs red; hind tibiae testaceous with their apices and tarsi black. ♂ with whole sternum, face, frontal orbits, scape beneath, trochanters, anterior and underside of hind coxae, stramineous. Length, $5\frac{1}{2}$ —7 mm. ♂ ♀.

This species is very closely allied to *M. haematodes* and I should consider it no more than a colour form of that species were it not that the mesonotal notauli are much more strongly impressed; otherwise it appears

to differ in little more than the black scutellum and paler hind tibiae; the sternum is sometimes partly rosy. I have also ventured to tentatively synonymise *M. parvus*, which no one has noticed but Holmgren who tells us it differs from *M. vigen*s in nothing but its smaller size of only 5 mm. and in the weaker sculpture of the strongly nitidulous and very finely alutaceous mesopleurae.

*M. vigen*s was recorded from Earlham in August in Bridgman's account of Norfolk Ichneumonidae (Trans. Norf. Soc. 1894, p. 625), together with a specimen from the same place at the same time, doubtfully referred to *M. parvus*. Mr. Champion has given me a female, named *M. vigen*s by Bridgman, which the former took at Aviemore in Inverness during 1876, and this agrees in every way with the description of that species and with Stephens' well-preserved type of *T. maculicollis*, from near London in July, now in Mus. Brit., excepting in its slightly longer petiolar discal carinae, somewhat more distinct areola and rather larger size. I beat an analogous female, with two co-specific males described above, on 6th September, 1910, from a large birch tree overhanging the road at Covehithe, near the Suffolk coast. A female, differing in its stramineous anterior coxae and trochanters, and concolorous pronotum and humeral marks, occurred to me on 19th July, 1910, on the top of Carramore Hill (500 feet) at Louisburgh, Co. Mayo.

30. *sternoxanthus*, Grav.

Tryphon sternoxanthus, Gr. I. E. ii. 178; Ste. Ill. M. vii. 240, ♀. *Mesoleius pulchellus*, Holmgr. Sv. Ak. Handl. 1855, p. 156; Kriech. Progr. Gymn. Pola, 1894, p. 22, ♂ ♀. *M. languidulus*, Holmgr. Sv. Ak. Handl. 1855, p. 161; Brisch. Schr. Nat. Ges. Danz. 1878, p. 84, ♂ ♀. *M. sternoxanthus*, Holmgr. Sv. Ak. Handl. 1855, p. 160; l. c. 1876, p. 27; Thoms. O. E. xix. 2051, ♂ ♀.

Head posteriorly constricted; mouth, clypeus, the short cheeks, whole in ♂ or except a central line in ♀ of face, and the ♂ frontal orbits, flavous; clypeus of ♂ apically broadly rounded with the margin narrowly deplanate on either side, of ♀ apically slightly emarginate; face narrower than frons. Antennae slender, piceous and longer than body with scape flavous, flagellum dull ferrugineous, beneath. Thorax with lateral mesonotal fasciae or in ♀ spots, a dot before and little line below radices, the sternum and lower part of pleurae, flavous; prothoracic margins and pectoral marks often fulvous; mesopleurae very shining and very smooth above, mesosternum laterally sparsely and obsoletely punctate; areola either subparallel-sided, narrow with fine costae or nearly wanting. Scutellum of ♂ entirely, of ♀ often only lined with, flavous. Abdomen subfusiform and somewhat nitidulous with venter and apices of all discal segments flavous; basal segment longer than hind coxae and not broad with sulcus centrally obsolete and extending beyond centre, apical angles obtuse; second quadrate with distinct thyridii; hypopygium in ♀ extending to anus, terebra stout with black valvulae. Legs normal, pale red; anterior coxae and trochanters stramineous; hind tarsi and apices of their tibiae indeterminately infusate. Wings with no, or hardly any, areolet; stigma infusate, radix and tegulae whitish; nervellus elongately anterfural. Length, 7 mm.

This species is well known in Sweden, Germany and France; it was recorded as British by Stephens in 1835 and has stood in our catalogues

ever since; but the single male in Stephens' collection, in Mus. Brit., labelled "var. 1—?" by Desvignes, is nothing but an unusually large *Mesoleptus prosoleucus*, Gr. Consequently, in the absence of all later records, it seems that we have but slender right to this species in our List.

31. *dubius*, Holmgr.

Mesoleius dubius, Holmgr. Sv. Ak. Handl. 1876, p. 33 (*nec* 1855); Brisch. Schr. Nat. Ges. Danz. 1878, p. 77; Thoms. O. E. xix. 2065, ♀.

Head a little constricted posteriorly; mouth and clypeus flavidous; clypeus transversely elevated and apically subtruncate. Antennae with flagellum ferrugineous beneath. Thorax with a flavidous dot before radices; notauli somewhat superficial, not extending to mesonotal centre and apically obsolete; mesopleurae shining and finely alutaceous; areola more or less evanescent; petiolar area generally entire, sometimes basally incomplete. Scutellum occasionally apically rosy. Abdomen with apical margin of anal segments pale; basal segment little longer than hind coxae, gradually dilated apically, acutely carinate laterally from spiracles to apex with basal fovea deep and apically nearly closed, but discal sulcus and carinae evanescent; second alutaceous and transverse; venter variegated with stramineous and infusate. Legs normal, red; hind ones with tarsi, apices of femora and the tibiae black, the last broadly white-banded before their base. Wings with no areolet; stigma infusate, radix and tegulae whitish; nervellus subopposite. Length, 8 mm. ♀ only.

This species is superficially like *M. flicornis* but with the clypeus apically emarginate, base of hind tibiae black, etc.

It ranges over north-west Europe and is by no means uncommon with us, probably more beneficial than has hitherto been suspected in destroying the gooseberry sawfly. It has been found at Govilon in Monmouth and bred at Nunton in Wilts "from *Nematus ribesii*" (Marshall coll.), Isle of Man in 1869 (F. Walker), found at Holgate near York in 1881 (Wilson), Norwich (Bridgman), bred in south Devon from *Nematus ribesii* on 27th August (Bignell). I have examples from Greenings in June, 1871 (Saunders), and Shere in Surrey (Capron); Brandon in Suffolk early in June, 1910 (Elliott); and have occasionally swept it in woods and marshes at Tuddenham at the end of August, Wangford in the middle of that month and at Herringswell, also in Suffolk, early in July; and both sexes have turned up in Denny Wood, in the New Forest, in the middle of June. I have seen a female bred from *Cladius pectinicornis* on 12th September, 1910, at Herne Hill, near London, by Stenton.

32. *furax*, Holmgr.

Mesoleius furax, Holmgr. Sv. Ak. Handl. 1855, p. 136; *loc. cit.* 1876, p. 34; Voll. Pinac. pl. xxiii, fig. 5, ♀.

Head slightly constricted posteriorly; mouth, clypeus, apices of cheeks and sometimes facial markings, pale stramineous; clypeal conformation as in the last species. Antennae black. Thorax with a stramineous dot before radices; sternum, meso- and meta-pleurae red; notauli evanescent; mesopleurae somewhat shining, very finely alutaceous below and hardly

sculptured at all above; areola and petiolar area finely costate or partly evanescent. Scutellum red. Abdomen with apical margins of the segments, and the venter, pale stramineous; basal segment a little longer than hind coxae, basal fovea large and apically closed, discal carinae and sulcus traceable; terebra short and stout. Legs red and slender; hind tarsi and tibiae black, with the latter broadly white before their base. Wings with no areolet; stigma nigrescent, radix and tegulae whitish; nervellus subopposite. Length, 6 mm. ♀ only.

This exclusively Swedish ♀ is recorded from "Norwich," with no intimation of its novelty as British, by Bridgman (Trans. Norf. Soc. 1894, p. 625). There is a large ♀ of 9 mm., undoubtedly referable to this species in Mus. Brit. ex coll. Desvignes, who thought it a form of *M. opticus*. Vollenhoven's figure with red mesonotum must represent a variety.

33. *opticus*, Grav.

Tryphon opticus, Gr. I. E. ii. 176; Ste. Ill. M. vii. 240, excl. ♂. *Mesoleius opticus*, Holmgr. Sv. Ak. Handl. 1855, p. 136, ♀; *loc. cit.* 1876, p. 33; Voll. Pinac. pl. xxiii, fig. 4; Thoms. O. E. xix. 2074, ♂ ♀.

Head not constricted posteriorly; mouth, the apically emarginate clypeus and in ♂ apices of the somewhat short cheeks and the face, whitish. Antennae with flagellum of ♀ subinfusate, of ♂ ferrugineous, beneath. Thorax with lateral mesonotal vittae and dots before radices whitish; at least the whole sternum red; mesopleurae shining and very finely alutaceous; metanotal areae complete with areola elongate and subrectangular. Scutellum red with its apex and postscutellum white. Abdomen with venter and apical margins of third to seventh segments white; basal segment somewhat longer than hind coxae, its discal sulcus and carinae distinct, extending beyond spiracles; second and third transverse, the former finely alutaceous. Legs normal and pale red; hind tarsi and tibiae black, with a white band before base of latter; ♂ with front coxae and trochanters stramineous. Wings with no areolet; stigma infusate, radix and tegulae whitish; nervellus subopposite. Length, 8 mm.

Holmgren placed this species between and considered it very closely allied to *M. dubius* and *M. furax*, but Thomson in 1895 regards it as most closely related to *M. sanguinicollis*, from which it differs in its emarginate clypeus, subopposite nervellus, very obsolete notauli, shorter petiolar area, longer petiolae with its narrower sulcus, as well as in the colouration of the thorax and hind legs.

Austria, Nuremberg, rare in Sweden early in September; Brischke bred it in Prussia from larvae of *Nematus fulvus* (*miliaris*, Pz.) and of *N. parvidus* (Schr. Phys. Ges. König. 1871, p. 73); Vollenhoven says he raised this species, probably in Holland, from *Nematus virescens*, to which Gaulle adds from France *Cimbex femorata* and *Pteronius Bergmanni*, Dlb. Stephens tells us he took it at Darenth wood in June, but his two extant females are referable to *M. haematodes*. Only once has it since been mentioned with us: T. Wilson says (Yorkshire Naturalist, vi, 1881, p. 153) that he took it hovering at willow stumps containing larvae of *Sesia bembeciformis* at York; "these specimens came from the stumps, but whether from these larvae or not I am not prepared to say" (Trans. Yorks. Nat. Union, 1882, p. 107). I have seen nothing like it.

34. *formosus*, Grav.

Tryphon formosus, Gr. I. E. ii. 185; Ste. Ill. M. vii. 242, ♂ ♀. *Mesoleius formosus*, Holmgr. Sv. Ak. Handl. 1855, p. 160; Gir. Ann. Soc. Fr. 1871, p. 400; Brisch. Schr. Nat. Ges. Danz. 1878, p. 82; Thoms. O. E. xii. 1262; xix. 2074, ♂ ♀. *M. lepidus*, Gir. Ann. Soc. Fr. 1871, p. 401, ♀.

A black species with the mouth, the apically subangulated clypeus, hamate mesonotal marks, scutellum, margins of abdominal segments somewhat broadly, and the venter whitish; the mesonotum clear red; legs fulvous excepting only the whitish hind tibiae which are apically, like their tarsi, black. Length, 6—8 mm.

This species differs from *M. variegatus* in having the body less stout and the clypeus neither apically emarginate nor its lateral foveae deeply impressed. It is too closely allied to *M. opticus* to need a detailed description: therefrom it may be known by the subdistinct notauli, hardly elevated thoracic costae, fulvous mesonotum, entirely whitish scutellum with centre of postscutellum concolorous, by the black ♀ sternum, the paler legs, the simply angulated centre of the clypeus, the more broadly white segmental margins and indistinct petiolar sulcus; the ♂ has the face with the cheeks broadly, the frontal orbits and mesosternum white, with the last laterally black above.

It occurs in northern and central Europe in May, and is said by Holmgren to frequent oaks in Sweden. Giraud recorded it in 1877 from *Blennocampa melanocephala*, *Selandria* (*B.*) *lincolata* (*bipunctata*, Klug) and *Periclista pubescens*; Dalla Torre adds *Dineura verna* and Gaulle *Croesus latipes* (cf. Giraud Ann. Soc. Fr. 1871, p. 400 and Fitch, Entom. 1879, p. 115); Brischke raised it from larvae of both *Nematus* and *Selandria*. With us it is distinctly uncommon and it was mixed by Desvignes and Marshall with *M. variegatus*; Stephens says he took it near London, but all his specimens are misnamed. I have seen examples captured by Richardson at Moreton near Weymouth on 23rd May, 1892, to which month it seems confined in Britain; and have both sexes taken or bred by Miss Chawner in the New Forest, a male found by Bignell in the Bickleigh Woods on 10th May, 1897, and another in Capron's Surrey collection. Marshall thought a male, he took at Botusfleming in Cornwall during April, 1891, was a form of *M. cognatus*, Brisch.

35. *caninae*, Bridg.

Mesoleius caninae, Bridg. Trans. Ent. Soc. 1886, p. 363, ♂ ♀.

A black species, with the mouth and scutellum fulvo-flavescens. Head finely reticulate, transverse and posteriorly suboblique; clypeus discreted, apically truncate, centrally impressed, and, like the mandibles, rufescent-flavous. Antennae as long as the body. Thorax short and stout; mesonotum subnitidulous, finely and somewhat closely punctate, with distinct notauli; mesopleurae glabrous and shining; metathorax discally short with areola distinct and apically strongly carinate; petiolar area large, nitidulous and finely reticulate. Scutellum and postscutellum rufescent-flavous. Abdomen short, dull, reticulate and as broad as thorax, about thrice length of second segment's apical breadth; segments transverse with the two basal of ♂ apically, and the apical ones of ♀, pale-margined; basal segment explanate throughout, laterally sinuate and a

third longer than apically broad, with its basal fovea apically open and continued bicarinately to beyond centre of postpetiole; anus subnitidulous. Legs not slender, red with only the hind tibiae and their tarsi entirely black. Wings with no areolet; nervellus antefurcal and intercepted below centre. Length, 6 mm.

In the facies of size and shape it is said to resemble *Erromenus frenator*, but with more slender legs. Superficially similar to *M. haematodes* but shorter and stouter, with the abdomen of ♀ much more convex.

Bridgman bred a single pair from larvae of the pear-tree saw-fly, *Eriocampa caninae*, found in a Norwich garden. The same author records (Trans. Norfolk Naturalists' Soc. 1894, p. 626) two more of his own species, *Mesoleius pedatus*, Bridg., and *M. calcaratus*, Bridg., from Brundall near Norwich: these are MS. names. I took a female of this species, peculiar for its short, squat conformation in a greenhouse of a garden at Ryde, in the Isle of Wight on 17th August, 1903. It is not yet known elsewhere.

36. *filicornis*, Holmgr.

Mesoleius filicornis, Holmgr. Sv. Ak. Handl. 1876, p. 40; Thoms. O. E. xix. 2068, ♂ ♀. (?) *Bassus athaliaeperda*, Curt. Farm Ins. 1860, 53, ♀.

Head posteriorly a little constricted; cheeks not buccate; clypeus apically depressed and truncate; mouth, clypeus and most of ♂ face stramineous. Antennae with flagellum apically ferrugineous beneath. Thorax short, subelevated and stout in front, with a dot or mark before radices stramineous and very determinate notauli extending to apex; mesopleurae alutaceously punctate and in ♂ subglabrous above; areola distinct, petiolar area with a very distinct in ♂ and obsolete in ♀ central carinula. Abdomen with the central incisures of ♂, rarely broadly, dull red; basal segment not narrow, about length of hind coxae, with basal fovea apically open and carinulae extending beyond spiracles; second nearly half as broad again as long with distinct thyridii; third transverse and shining, following becoming gradually smoother, with terebra short. Legs pale red with the normally stout hind tarsi and their tibiae black, the latter basally broadly white-banded. Wings with stigma dull stramineous, radix and tegulae white; areolet wanting; nervellus antefurcal. Length, 6 mm.

Thomson says the base of clypeus and centre of ♂ face are black, he also introduces a white pronotal callosity in both sexes; he considers this species distinct in its black scutellum and venter which is only white-margined, and in the colouration of the clypeus and ♂ face.

It is impossible to tell what Curtis' "*Bassus*" was, but I think the inadequate description leaves but little doubt that it belongs to the present genus, wherein there are points of analogy with *M. filicornis*. *Bassus* does not prey upon saw-flies, and Curtis bred his insects in England from the destructive "*Black Jack*," *Athalia spinarum*, Fab.

The first intimation we have of this species, elsewhere only recorded from central Sweden, as British is Bridgman's chatty statement (Trans. Norf. Soc. 1893, p. 63) that he took a couple of specimens on ling at Mousehold Heath near Norwich, and that he thought "it not improbable they were parasitic" on *Tenthredo obsoleta*; at *lib. cit.* 1894, p. 625, he says he has also found this parasite at Eaton and Brundall, in Norfolk. It has

hitherto been mistaken for *M. caligatus* with us and is fairly common, though there are no records. Marshall took it at Botusfleming in Cornwall and Cornworthy in Devon, and thought it *M. carinatus*, Holmgr., which is a ♀ with laterally pale face, whereas in the present species the male face is centrally black; Bignell found it about Plymouth, Capron at Shere (labelled *M. caligatus*) and Piffard at Felden (labelled *M. aulicus*). It has occurred to me sparingly both in the New Forest and Tuddenham Fen, Suffolk, in June and August.

37. *pyriformis*, Ratz.

Tryphon pyriformis, Ratz. Ichn. d. Forst. iii. 124, ♀. *Mesoleius unifasciatus*, Holmgr. Sv. Ak. Handl. 1855, p. 162; *lib. cit.* 1876, p. 45; Brisch. Schr. Phys. Ges. König. 1871, p. 80; Schr. Nat. Ges. Danz. 1878, p. 84; *l.c.* 1891, p. 60; Thoms. O. E. xix. 2048, ♂ ♀.

Head slightly constricted posteriorly; cheeks subbuccate; clypeus transversely elevated, apically truncate or very slightly emarginate with the apex entire; mouth, clypeus, face and apices of cheeks, flavous. Antennae with scape flavidous, and flagellum pale ferrugineous, beneath. Thorax stout, anteriorly subelevated, with notauli slender and hardly extending to apex; pronotal margin, hamate lateral mesonotal fasciae and radical marks, flavous; mesopleurae finely punctate-alutaceous and shining. Scutellum flavous, in ♀ very rarely black. Abdomen with the segments narrowly pale-margined, the third with a triangular testaceous basal mark, and the venter flavous; basal segment slightly longer than hind coxae, gradually strongly constricted basally, with the sulcus more or less distinct; second alutaceous and broader than long, with transverse and somewhat conspicuous basal thyridii. Legs red with anterior coxae and trochanters flavous; hind tarsi and tibiae nigrescent, with a broad whitish band before base of latter; hind femora somewhat stout. Wings with stigma pale piceous, radix and tegulae stramineous; areolet wanting; nervellus subopposite or antefurcal. Length, 7 mm.

This species is like *M. multicolor* in size, colour and the wanting areolet, though distinct in the abdominal colouration, the centrally very broadly and slightly callose clypeus, longer palpi and basally infuscate hind tibiae. I see no reason to doubt the correctness of Brischke's synonymy, here for the first time adopted.

Ratzeburg says Brischke bred this species from larvae of *Tenthredo* (*Selandria*, Brisch.) *stramineipes* in Germany on 7th April. Holmgren adds that his species is not infrequent in shady woods in central and southern Sweden, "*praesertim in Pleride aquilina*," upon which the above sawfly larvae feed during July (Cam. iv. 169). *M. unifasciatus* is recorded by Bridgman (Trans. Norf. Soc. 1894, p. 626), with no intimation of its novelty as British, from Earlham near Norwich; and there is a ♂ from Botusfleming in Marshall's collection, named by him *M. pulchellus*, Holmgr., which its author in 1876 synonymised with *M. sternoxanthus*, but in this case the clypeus appears truncate. I have found this species upon several occasions in the New Forest during the first half of July, associated with an abundance of the ♀ imagines of the above host, at Wilverley on bracken, at Lyndhurst, Matley Bog and on bracken at Setley.

38. *multicolor*, Grav.

Tryphon nacevius, var. 1, Gr. I. E. ii. 153, ♀. *T. multicolor*, Gr. l.c. 168; Ratz. Ichn. d. Forst. i. 128, ♀. *Mesoleius multicolor*, Holmgr. Sv. Ak. Handl. 1855, p. 160; l.c. 1876, p. 41; Thoms. O. E. xix. 2046, ♂ ♀. Var. *M. napacus*, Holmgr. l.c. 1855, p. 161; l.c. 1876, p. 42, ♂ ♀. Var. *M. dives*, Holmgr. l.c. 1855, p. 162; l.c. 1876, p. 105, ♂.

An elongate and slender black species. Head obviously constricted posteriorly; cheeks subbuccate and apically flavous; mouth, the apically emarginate-truncate clypeus and the face flavous. Antennae slender, dark rufescent beneath with scape paler, and second flagellar joint linear. Thorax elongate with margin of pronotum, a line beneath and at least in ♂ callosity before radices, in ♂ also lateral mesonotal and pectoral marks, stramineous; mesopleurae alutaceous; areola often wanting, rarely with carinae entire though fine; petiolar area semilunar with distinct carinae. Scutellum flavous, rarely in ♀ fulvidous. Abdomen black with the segmental margins and venter flavous; basal segment narrow, a little longer than hind coxae, with apical angles obtuse and the discal sulcus evanescent; second somewhat shorter than broad, alutaceous and like the following pubescent. Legs red, with anterior coxae and trochanters stramineous; the slender hind tarsi and apices of their stramineous tibiae infusate; fourth hind tarsal joint linear. Wings with stigma subtestaceous, radix and tegulae flavous; areolet rarely externally pellucid; nervellus subopposite. Length, 8—9 mm.

The varieties consist in having the thorax black or with humeral marks, the scutellum pale and a sternal mark, larger in ♂, concolorous.

Northern and central Europe; common in Germany during June and July, whence Ratzeburg says (doubtless *in errore*) that Dahlbom bred a female on 24th July, 1834, from *Tinea padella*; Giraud in 1877 gives *Lophyrus polytomus* as an Austrian host; common in central and southern Swedish woods; France, Belgium, etc. Bridgman records it from Norwich and named a specimen captured in 1879, by the Rev. E. N. Bloomfield, at Guestling in Sussex; there is a female named by Gravenhorst in Mus. Brit., with several from Desvignes' and Marshall's collections, the latter from Botusfleming in 1890 and Bishops Teignton in Devon. Elliott has taken this species by sweeping heather at Cromer early in September, 1903, as well as at North Berwick in August, 1908; and Miss Chawner has given it me from the New Forest. In Suffolk it must be extremely rare, for I took a male on mountain ash in the Bentley Woods on 17th May, 1898, and a female in my garden at Monks' Soham on 24th August, 1909.

39. *niger*, Grav.

Tryphon niger, Gr. I. E. ii. 126; Ste. Ill. M. vii. 231, ♀; Ratz. Ichn. d. Forst. i. 114, pl. i, fig. 9, ♂ ♀. *Mesoleius niger*, Holmgr. Sv. Ak. Handl. 1855, p. 165; l.c. 1876, p. 50; Brisch. Schr. Nat. Ges. Danz. 1878, p. 85; Thoms. O. E. xix. 2049, ♂ ♀.

A narrow black species, with hind tibiae slender and conspicuously white. Head buccate with the vertex broad; mandibles stout, with lower tooth somewhat the longer; clypeus apically broadly rounded, its margin inflexed and obsolete, with lateral angles inconspicuous; cheeks short and apically stramineous; mouth, clypeus and face concolorous. An-

tennae fulvescent, with scape flavidous, beneath. Thorax anteriorly sub-elevated with at most a small pale callosity before radices; notauli short and slender; mesopleurae alutaceous, with speculum glabrous and nitidulous; metanotal areae wanting, petiolar area minute and very incomplete, spiracular area often excarinate above. Abdomen of ♂ with central segments pale marked or margined, of ♀ with only incisures pale; ventral plica flavidous, apically black; basal segment narrow, twice longer than apically broad with basal fovea distinct and discal sulcus obsolete; second and third longer than broad with strong thyridii. Legs slender, strongly elongate and pale red with anterior coxae and trochanters of ♂ stramineous, of ♀ basally black; hind legs black with apices of trochanters and a broad central tibial band extending nearly to the base, whitish, their tarsi testaceous; hind calcaria white and linear. Wings with stigma pale infusate, radix and tegulae whitish; areolet usually entire. Length, 8—12 mm.

Both sexes are said to occasionally have the abdomen mainly red above (? *M. femorator*, Thoms. 2047) and the hind coxae and femora of the ♂ are rarely red-marked. The clypeal conformation is unique in the present genus, in which the elongate form is remarkable.

This species should be common wherever bracken is found in any quantity, certainly its single known host is sufficiently abundant; but I can only find it recorded rarely from Silesia and the Hartz, uncommonly in central and southern Sweden, from Prussia and France. Ratzeburg records it as having emerged with *Strongylogaster cingulatus* in 1849 (*loc. cit.*) and Brischke bred it from larvae of the same host (*loc. cit.*), having already raised a ♀ from a sawfly larva of doubtless the same species found on *Pteris aquilina* (Schr. Phys. Ges. König. 1871, p. 80). Stephens' ♂ from Darenth Wood, now in Mus. Brit., is correctly named; Marshall found a pair at Lydford in 1882 and Lasingham in Yorks; and it has been somewhat doubtfully reported from Bradford (Trans. Yorks. Union, 1878, p. 70). I have only seen single specimens, and it appears uncommon though widely distributed in England; Oxshott on 24th June, 1897 (Beaumont), Shere in Surrey (Capron), Felden in Herts (Piffard). Only a single pair has occurred to me, the ♂ on flowers of *Heracleum sphondylium* on 10th July, 1900, at Westleton lamb pits, in Suffolk and the ♀ among bracken on 11th July, 1909, at Hursthill in the New Forest.

40. *renovatus*, n.n.

Mesoleius ? *brevispina*, Bridg. Trans. Ent. Soc. 1887, p. 372, ♂ (*nec M. brevispina*, Thoms. O. E. ix. 934 *nec non Saotus brevispina*, Thoms. O. E. xix. 2018).

Head transverse, posteriorly constricted; clypeus apically truncate, depressed and before the apex transversely elevated; face and frontal orbits flavous. Antennae about as long as the body and infusate, rufescent beneath. Thorax shining, with notauli obsolete; prothorax below, large hamate mesonotal marks, two discal mesonotal vittae, callosity before and below radices, mesopleurae and sternum, flavous; mesopleurae obsoletely reticulate; areola and petiolar area subdistinct. Scutellum centrally or entirely flavous. Abdomen black and compressed from the second segment, with extreme apex of the first, of the second broadly, a narrow discal mark on apices of the remainder, and the venter, flavous; basal segment longer than broad, centrally depressed, with basal

fovea sometimes continued sulcately to the parallel-sided postpetiole; second and third segments longer than broad. Legs normal; the front ones entirely, with hind coxae and trochanters, flavous; hind femora red, their tarsi and tibiae infusate with base of the latter dull white; hind calcaria a little longer than one-third of their metatarsus. Wings with tegulae flavous, stigma infusate; areolet wanting, recurrent nervure not fenestrate; nervellus slightly antefurcal and obsoletely intercepted far below its centre. Length, 5 mm. ♂ only.

The extent of the abdominal markings is said by Bridgman to vary.

This species cannot be the *M. (Saotus) brevispina* of Thomson; it was brought forward as such with considerable hesitancy by Bridgman; the latter differs in having the mesosternum black, hind coxae red, second segment quadrate, anus entirely whitish and the hind calcaria not longer than one-third of their metatarsus.

Introduced and described by Bridgman (*loc. cit.*) from several males bred by Fletcher from a new leaf-rolling sawfly, *Nematus purpurea*, Cam., discovered by him in June, 1886, on *Salix purpurea* at Worcester. I possess a male of this species, from the same source, of hardly more than three and a half millimetres in length.

41. *compressiusculus*, Thoms.

Mesoleius (Saotus) compressiusculus, Thoms. O. E. ix. 934. *Saotus compressiusculus*, Thoms. O. E. xix. 2019.

Black, with the clypeus and hamate lateral mesonotal marks whitish-testaceous; mesosternum black. Apices of abdominal segments two to six somewhat broadly whitish-testaceous; anterior coxae whitish; hind coxae basally black. Length, 3—5 mm. Sex not noted.

Known by the lateral stricture between the second and third dorsal segments, the white hamate mesonotal marks and basally black hind coxae. It differs from *M. brevispina*, Thoms., in the broader radial cell, hardly discreted frenal scrobes, black scutellum, narrower and basally less elevated petiole and broader terebral valvulae.

Bridgman says (Trans. Norf. Soc. 1894, p. 626), with no hesitation, that he has captured this insect at Eaton near Norwich in June. From the above details of the species, the whole vouchsafed by Thomson, his specimen was probably named by its author.

DYSPETES, Förster.

Först. Verh. pr. Rheinl. 1868, p. 201.

Body black and pubescent. Face subdeplanate, centrally and apically elevated; clypeus strongly discreted and apically very broadly rounded; mandibular teeth of equal length; eyes oblong and cheeks not short; vertex angularly excised centrally. Metathoracic areae distinct, but not complete; the spiracles circular and not large. Abdomen with the carinae of the hardly petiolate basal segment elongate but obsolete, and its subprominent spiracles slightly before the centre; second segment with broad and deeply impressed thyridii, third subimpressed basally on either side; hypopygium large and extending almost beyond the pygidium; terebra very slightly exerted. Tarsal claws stout and mutic. Areolet entire and tetragonal, transverse, large and sessile.

Thomson first employed *Dyspetus* in 1883 (O. E. ix. 895 *et* 899) for the reception of the present species, and he placed it in the *Tryphonini*, from the remainder of which he distinguished it by its complete areolet, stout and mutic claws, and centrally angulated vertex. Ashmead is certainly in error in placing *Dyspetus*, as he does (Proc. U. S. Nat. Mus. 1900, p. 36), in the *Pimplinae* and allying it with *Glypta* on account of the impressions of its second and third abdominal segments, which represent little more than thyridii. With the exception of its Mesochoroid areolet, which is quite distinct in this subfamily, its whole facies is Tryphonid.

1. *praerogator*, Linn.

Ichneumon praerogator, Linn. S. N. 1758, 565; F. S. 1761, 405; Fab. Piez. 99; Jur. Hym. 107; Gr. Nov. Ac. Acad. 1818, p. 285; Oliv. Encycl. Méth. 191; Thunb. Mem. Ac. Peters. 1824, p. 349. *I. mandibulator*, Thunb. *lib. cit.* p. 343. *Tryphon praerogator*, Gr. I. E. ii. 127; i, Suppl. 687; Ste. Ill. M. vii. 232; Blanch. Hist. Ins. iii. 308, ♂ ♀. *Mesoleius praerogator*, Voll. Tijds. v. Ent. 1877, p. 64. *Dyspetus praerogator*, Thoms. O. E. ix. 899, ♂ ♀.

A black species with white pubescence and the mouth and legs, except usually the hind ones, red. Head transverse but not abruptly constricted posteriorly, occiput acutely emarginate centrally; frons and face distinctly



punctate; clypeus subglabrous and, except basally, testaceous; mandibles and palpi concolorous. Antennae as long as the body and filiform, black and becoming rufescent apically. Thorax black, dull and immaculate, with obsolete notauli; metathorax closely punctate with the areola elongate, not discreted from basal area and emitting no costulae; lateral carinae entire, and the small petiolar area discreted. Scutellum black and not margined. Abdomen shagreened and hardly shining, fusiform

and apically obtuse; second and third segments subimpressed transversely before their apices, and obliquely in their basal angles; basal segment scabriculous and more than double length of the stout terebra. Legs red, with the coxae darker; hind legs usually entirely black. Wings hyaline or flavescent, with stigma ferrugineous; areolet transverse and large, hardly sessile; basal nervure continuous through median; nervellus intercepted slightly below its centre. Length, 7—11 mm.

Marshall did not believe this to be the original *Ichneumon praerogator* of Linnaeus and I have little doubt that he was correct, unless its author erred in his statement "habitat in *Phalaenae Salicis* larva," presumably copied by Fabricius in 1804 "in Larva *Bombycis Salicis*." It would surely have been subsequently bred from so closely observed a host, whereas the above is the only indication we have respecting the economy of this abundant species. On the Continent, however, it appears rarer than with us: Gravenhorst found "some" in 1809 only, subsequently recording half a dozen from Hope at Netley; Blanchard considered it somewhat rare about Paris in 1840; and in Sweden it was not seen till 1883, and was unknown to Holmgren. Van Burgst records both sexes from about Breda in June. Its distribution is nevertheless very wide, and I have seen both sexes from as far East as Darjiling, where they were swept and taken at light, at an altitude of six and a half thousand feet. In Britain it is one of our very commonest autumn species, constantly observed on the tables of roadside umbelliferae, though Stephens' reference to it in June and July is a slip of memory, for it is never abroad before 12th August, is in fact rare throughout August, abundant throughout September and extends to 6th October. It is most frequently seen on reeds and *Angelica* flowers in damp places, though not rarely on *Heracleum*, ragwort and wild carrot flowers in drier situations, in woods it may be beaten from hazel, and once I swept it long after night had descended. This species flies to flowers, much as does *Exetastes cinctipes*, with longly outstretched, drooping legs and the antennae bent forwards, with their apices upturned and flowing backward; it hovers for only a moment and alights gently, with circumspection. I have records from sixteen English counties: Kent (Beaumont), Sussex (Bloomfield), Hants (Miss Chawner), Surrey (Capron and Stenton—figured), Herts (Piffard), Cornwall (Marquand), Devon (Bignell), Dorset (Dale), Somerset (Charbonnier), Gloucester (Watkins), Worcester (Gorham), Lincs (Thornley), Norfolk (Bridgman), Suffolk (Tomlin and Tuck), Yorks (Bradford Sci. Journ. 1908, p. 71, etc.), Lancs (Martineau); Marshall took it in South Wales; Beaumont at Enniscorthy and Courten in Ireland; and at Pitlochry in Scotland, Evans has sent it me from Edinburgh, Kinghorn, Gullane Links and Craigen-tinny; Mallock from Dumbarton, and Elliott from Birnam in Perth. I suspect the host of being one of the common *Juncus*-feeding *Doleri*; I have seventy examples of the parasite: the host must be at least equally abundant.

TREMATOPYGUS, *Holmgren*.

Holmgr. Sv. Ak. Handl. 1855, p. 179.

Body dull and closely punctate throughout. Head dilated or subdilated behind eyes; clypeus often strongly punctate, generally slightly emarginate or broadly rounded apically. Antennae filiform, very rarely centrally a little incrassate, with first flagellar joint a little longer than the

second. Thorax dull; metanotal areae complete or irregular. Abdomen usually basally subscabrous on second and third segments; basal segment often somewhat curved, not petiolate, evenly explanate throughout; terebra either straight and short or curved, slender and subexserted; ♂ valvulae curved and usually far apart; hypopygium of ♂ depressed and emarginate, of ♀ convex, apically rounded and entire. Legs normal and somewhat slender. Areolet wanting or triangular.

In its capital structure, that of the antennae and legs, but especially in the very distinct puncturation of the whole body, this genus forms a natural link between *Tryphon* and *Mesoleius*, differing from both in its posteriorly dilated head and from the former in its basally narrower abdomen. The genus *Rhaestus* was erected by Thomson (O. E. ix. 924) for the reception of a part of *Grypocentrus* of Holmgren upon the characters:—Palpi short and cheeks distinct, legs not stout, areolet sessile, lower basal nervure oblique and distinctly postfurcal; it was placed between *Cataglyphus* and *Mesoleptus* (O. E. xix. 1976) but this is an untenable position, at least for our species, which has the basal segment evenly and strongly explanate throughout, not petiolate, and very little longer than apically broad, with antecentral spiracles; it differs from the present genus mainly in its nitidulous body and may temporarily be treated of here.

Table of Species.

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|------|----|--|--------------------------------|
| (8). | 1. | Third segment not impressed; abdomen mainly red. | |
| (7). | 2. | Arolet entire; clypeus not truncate. | |
| (4). | 3. | Thorax and abdomen strongly shining; vertex narrow | 1. LATIVENTRIS, <i>Holmgr.</i> |
| (3). | 4. | Thorax and abdomen strongly sculptured; vertex normal. | |
| (6). | 5. | Hind tibiae broadly pure white; postpetiole sulcate | 2. ALBIPES, <i>Grav.</i> |
| (5). | 6. | Hind tibiae dull testaceous; postpetiole not sulcate | 3. ERYTHROPALPUS, <i>Gmel.</i> |
| (2). | 7. | Arolet wanting; clypeus apically subtruncate | 4. VELLICANS, <i>Grav.</i> |
| (1). | 8. | Third segment distinctly impressed; only incisures red | 5. ATRATUS, <i>Holmgr.</i> |

1. lativentris, *Holmgr.*

Grypocentrus lativentris, Holmgr. Sv. Ak. Handl. 1856, p. 384, ♀; cf. *Rhaestus lativentris*, Thoms. O. E. xix. 1975.

Somewhat shining and not coarsely punctate with deplanate, mainly red abdomen. Head with the vertex narrow, but temples nearly as broad as eyes; mandibles red; clypeus apically broadly rounded. Thorax very finely punctate, shining and black; areola distinct, narrow, parallel-sided and shorter than the horseshoe-shaped petiolar area; costulae wanting. Abdomen strongly deplanate, bright red with the base and apex more or less broadly infuscate; basal segment very slightly curved, basally narrow, explanate throughout, and narrowly subsulcate but not carinate discally to centre of postpetiole; anus explanate, terebra not reflexed. Legs with their base, and sometimes the apices of hind femora and tibiae, black.

Wings with stigma piceous, tegulae white; areolet entire and sub-pentagonal, emitting recurrent nervure a little beyond its centre; nervellus almost straight, intercepted at its lower third. Length, 6 mm. ♀ only.

Instantly known among its present associates by its shining body, narrow vertex and the strongly postfurcal lower basal nervure.

This insect appears very little known. It is said by Holmgren, in describing the female, to have once been taken in Sweden on 10th June, and Gaulle records it from France. Bridgman first found in Britain (Trans. Ent. Soc. 1886, p. 359) a female at the end of May, 1882, at Earham near Norwich; and a second occurred to me on 30th May, 1898, by beating bushes of mixed growth in Stanstead Wood, Suffolk.

2. *albipes*, Grav.

Tryphon albipes, Gr. I. E. ii. 221, ♀. *Mesoleius albipes*, Brisch. Schr. Phys. Ges. König. 1871, p. 82, ♀. *Trematopygus albipes*, Brisch. Schr. Nat. Ges. Danz. 1878, p. 91, ♀. *Synomelix albipes*, Ffank. Zeits. Hym.-Dip. 1906, p. 291, ♂ ♀.

A black species with the abdomen centrally red and hind tibiae broadly white. Head distinctly narrow posteriorly and strongly transverse;



mouth, clypeus and in ♂ both face and cheeks flavous; face closely punctate, dull and convex; clypeus subdiscreted, apically impressed and sinuate; vertex abruptly declived. Antennae filiform and black, with flagellum basally rufescent beneath. Thorax entirely black or in ♂ with pale radical callosities; notauli distinct and extending to disc;

mesopleurae punctate and shining; metanotum not smooth, areola and petiolar area confluent and strongly carinate, basal area subquadrate, costulae strong. Scutellum black. Abdomen oblong-ovate, black with the second and third segments red, usually discally or mainly black; basal segment gradually explanate throughout and not half as long again as the breadth of its aciculate apex, strongly sulcate and bicarinate to centre of postpetiole; terebra reflexed, not exerted. Legs fulvous and not slender with coxae, base of trochanters, hind tarsi, apices of their femora and apical third of their pure white tibiae, black; hind calcaria, and ♂ anterior coxae and trochanters entirely, stramineous. Wings ample and hyaline, radix and tegulae stramineous, stigma pale piceous and somewhat broad; areolet small and petiolate, with outer nervure curved; nervellus slightly antefurcal, intercepted at its lower third. Length, $4\frac{1}{2}$ — $7\frac{1}{2}$ mm.

This species must be much rarer on the Continent than in Britain, for it was not adequately described nor the ♂ known till Pfankuch examined the type ♀ in 1906 and he says that the species noticed under this name by Kriechbaumer (Ent. Nachr. 1897, p. 186) is distinct.

It is only recorded from Breslau, France and Prussia, where Brischke bred it in 1878 from larvae of *Nematus aethiops*. Stephens took this species and Desvignes correctly named his own four examples; Marshall found it at Nunton in Wilts, Bugbrooke in Northants, Cornworthy in Devon and Botusfleming in Cornwall; it occurred to Bridgman at Earls- ham, near Norwich, in July, and to Parfitt by sweeping among grass and clover in May in Devon. I possess it from Blackheath in June, 1899 (Beaumont), captured at Brockenhurst on 2nd June, 1910 (Lyle); Scotton Common in Lincs. (Thornley), Felden in Herts (Piffard), Benacre Broad in Suffolk at the end of August, 1900 (Tuck), and have found it at the beginning of June by sweeping in Wicken Fen in Cambs., in July in Beaufort Park near Hastings, early in August in a Lyndhurst greenhouse and in the middle of September at Foxhall near Ipswich on the flowers of *Angelica sylvestris* in marshes.

3. erythropalpus, Gmel.

Ichneumon erythropalpus, Gmel. S.N. 1790, 2702. *Tryphon erythropalpus*, Gr. I. E. ii. 290; Ste. Ill. M. vii. 259; Fonsc. Ann. Soc. Fr. 1849, p. 230, ♂. *Trematopygus erythropalpus*, Holmgr. Sv. Ak. Handl. 1855, p. 183, ♂ ♀; cf. Thoms. O. E. ix. 927 et xix. 1999.

A dull subrugulose species, with cubical head and obliquely flavous-marked face. Head subcubical, posteriorly not constricted; black with mouth, clypeus and the face obliquely on either side below scrobes, flavous; frons dull and scabrous, not carinate; clypeus coarsely punctate, rarely black, apically somewhat rounded; lower mandibular tooth the longer. Antennae nearly length of body, filiform, ferrugineous beneath with scape flavous. Thorax black; mesonotum dull, discally deplanate, with only apical notauli; metanotum convex, rugulose with no areae and only the sides of the petiolar apically indicated. Abdomen subsessile and oblong-ovate and red with the first segment except usually its apex, and anus from fourth or fifth, black; basal segment evenly dilated throughout, scabrous or in ♂ roughly punctate, nearly twice longer than

apically broad, at its base sulcate and strongly bicarinate; second a little impressed centrally on either side; terebra not exerted. Legs normal, the anterior fulvous with coxae and base of trochanters black, hind ones black with apex of trochanters and tibiae except at apex and extreme base testaceous. Wings nearly hyaline with stigma testaceous, radix and tegulae white; arcelet irregularly triangular, elongately petiolate, rarely obsolete; nervellus intercepted below its lower third. Length, 8 mm.

It occurs on the Continent in May and June; Brischke (Schr. Phys. Ges. König. 1871, p. 87) bred a ♀ from larvae of *Dolerus gonager* and Gaulle adds *Loderus vestigialis* as a French host. Stephens took it at Hertford in July, 1835, and near London; there is a long series in Mus. Brit. from his and Desvignes' collections, with others found by Marshall at Govilon in South Wales and Nunton in Wilts. Capron took a couple of ♀ ♀ at Shere in Surrey, but neither Bridgman nor I have met with it.

4. *vellicans*, Grav.

Tryphon vellicans, Gr. I. E. ii. 263, ♂. *Trematopygus vellicans*, Holmgr. Sv. Ak. Handl. 1855, p. 182, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 90, ♀; cf. Thoms. O. E. ix. 930.

A somewhat dull species with face black and the red second and third segments scabrous. Head transverse, subbuccate, punctate and black; palpi and mandibles alone, or also apex of clypeus, testaceous; frons rugosely punctate, deplanate, carinate; face centrally a little convex, punctate; clypeus subdiscreted, shining, sparsely and coarsely punctate, and apically subtruncate. Antennae filiform and a little shorter than body; flagellum fulvous, apically darker, with two basal joints subequal. Thorax narrower than head, a little shining and black; notauli distinct, pleurae subaciculate; metanotal areae distinct, areola centrally curved, lateral areae large, costulae rarely indicated. Scutellum black. Abdomen black with second and third segments transverse, coriaceous and more or less, or in ♀ entirely, red; fourth basally or mainly red; basal segment subcurved, scabriculous, black and discally a little sulcate, ♂ spiracles somewhat prominent; terebra curved and not exerted; ♂ hypopygium emarginate and valvulae sometimes exerted. Legs slender and red with coxae, except sometimes front ones, black. Wings subinfumate with stigma and tegulae nigrescent, former basally and latter apically pale; radix stramineous; arcelet wanting; nervellus oblique and intercepted far below centre. Length, 5—6 mm.

The abdomen is said to occasionally be dark castaneous throughout, or the ♀ may have the mouth and apices of hind femora infusate.

This species appears to have only been found in any numbers by Holmgren in northern Sweden, though Grav. took a couple of males about Breslau in May, Gaulle records it from France and Brischke from Prussia. It has stood in our list since 1870, but I know not upon what authority, and should have regarded it with some suspicion had not Bridgman named an example for Bignell, taken by the latter "at Tavistock Road, 4th August," in south Devon.

5. *atratus*, Holmgr.

Trematopygus atratus, Holmgr. Sv. Ak. Handl. 1855, p. 181, ♀; Brisch. Schr. Phys. Ges. König. 1871, p. 86; Schr. Nat. Ges. Danz. 1878, p. 90; l.c. 1892, p. 38, ♂ ♀. *Spudaeus atratus*, Thoms. O. E. xix. 2010.

A somewhat dull species with the abdominal incisures pale, and segments two and three transimpressed. Head subdiluted behind the eyes; black, ♀ with mouth and clypeus red, ♂ with palpi, mandibles, face and cheeks flavous; clypeus apically subemarginate and centrally produced. Antennae nigrescent, of ♂ with scape flavous and flagellum rufescent beneath. Thorax black, ♂ with marks on the pro- and meso-sternum flavous; metathorax somewhat short, areola sulciform and short, costulae wanting, petiolar area large. Abdomen scabriculous and black with incisures rufescent; three basal segments very closely punctate and transversely impressed; basal segment a little curved, broad, a little constricted basally and hardly sulcate discally. Legs red with coxae, base of trochanters, hind tarsi and their subtestaceous tibiae apically, black; ♂ with trochanters and anterior coxae flavous. Stigma infusate, basally paler; areolet wanting; nervellus intercepted a little below its centre. Length, 6—8 mm.

At once known by its distinctly impressed second and third basal segments.

Sweden, Prussia and France. Brischke records it in 1878 from larvae of *Nematus septentrionalis*; and it was introduced as British by Bairstow (Trans. Yorks Nat. Union, 1882, p. 107; cf. Trans. Ent. Soc. 1882, p. 157) on the strength of several examples bred by Wilson in 1881 from *Croesus septentrionalis* at York. Later, Bridgman says that it was also bred from *C. varians* and captured by Atmore at Kings Lynn in Norfolk; I took a ♀ on birch in Tuddenham Fen, Suffolk, on 9th June, 1910, with immaculate incisures and possess a typical ♂, captured by Rev. A. Thornley at Scotton Common, near Gainsborough, on 22nd of the same month in 1898.

TRYPHON, Fallén.

Fall. Specim. Hym. (1813), 16; Holmgr. Sv. Ak. Handl. 1855, p. 185.

Head transverse and hardly dilated posteriorly; vertex not centrally incised; clypeus apically broadly rounded, and generally transversely elevated before its centre, impressed before its apex; oral costa usually elevated; labrum hardly exerted; frons black, rarely cornute. Antennae filiform, rarely as long as body. Thorax stout; epomiae large and extending nearly to mesonotum; metanotal areae usually distinct and entire. Scutellum black. Abdomen centrally red, with the segments not impressed; basal segment nearly always with two parallel discal carinae, a little narrowed but not acutely dentate basally, with spiracles before its centre; second with distinct thyridii; terebra short and straight. Legs normal with femora stout and not elongate; tarsal claws not pectinate, ungues stout and curved. Areolet entire, irregular and generally petiolate; tegulae black, at most apically testaceous; nervellus postfurcal or opposite.

So very rarely have our species of this genus been bred—once from a *Dolerus* in Prussia, once from a *Selandria* in France and once from

an *Athalia* in Austria—that I think one is justified in the supposition that the Tenthredinids are not hosts of these abundant parasites, especially when the number of *Mesoleii*, etc., bred thence by Brischke is considered. Mr. J. E. Fletcher's most interesting discovery of the economy of *Tryphon signator* points to a very probable parasitism of the present genus upon the fossorial aculeates to whose ecdyses so little attention has been yet paid, in spite of the notice their interesting habits in the perfect state have from the earliest times excited. Wasps' and the larger bees' nests have frequently been kept under observation, with the result that we know hymenopterous parasites in most of our species; but those of fossors, whether constructed in sand, clay or rotten wood, are more difficult to come at and have consequently been very little studied.

In his 1898 list of South Devon Ichneumonidae, Bignell says he has taken "*Trematopygus rubiginosus*, Gr.," at Princetown towards the end of June. This *Tryphon*, sensu Grav., had not before been noted as British; and Pfankuch tells us that the type is *Acrotomus insidiator*, Holmgr., ♂. Bignell's insect was most probably named by Rev. T. A. Marshall, in whose collection I find three males of *Tryphon*, sensu stricto, under the name *rubiginosus*, Gr. These, however, are nothing but one *Tryphon elongator* and two *Tryphon signator*, all somewhat small with unusually infusate abdomens.

Table of Species.

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|-------|-----|--|--------------------------------|
| (4). | 1. | Frons with a distinct central, elongate horn. | |
| (3). | 2. | Horn not apically incised; coxae black [COSMOCONUS, Först.] | 1. ELONGATOR, <i>Fab.</i> |
| (2). | 3. | Horn apically incised; coxae pale [COELOCONUS, Först.] | 2. BRACHYACANTHUS, <i>Gml.</i> |
| (1). | 4. | Frons with no central horn. | |
| (8). | 5. | Scrobes internally elevated; hind femora red [SYMPOETHUS, Först.] | |
| (7). | 6. | Basal segments, metanotum and frons finely punctate | 3. HELOPHILUS, <i>Grav.</i> |
| (6). | 7. | Basal segments, metanotum and frons scabriculous and dull | 4. EXCLAMATIONIS, <i>Grav.</i> |
| (5). | 8. | Scrobes internally simple; hind femora almost always black. | |
| (10). | 9. | Metanotum glittering with no longitudinal costae [PSILOARGE, Först.] | 5. EPHIPPIUM, <i>Holmgr.</i> |
| (9). | 10. | Metanotum punctate with longitudinal costae. | |
| (16). | 11. | Scrobes auricularly dilated above the antennae, as figured [OTITOCHILUS, Först.] | |
| (15). | 12. | Face partly or entirely flavous. | |
| (14). | 13. | Anus immaculate red; all the trochanters black-marked | 6. RUTILATOR, <i>Linn.</i> |
| (13). | 14. | Anus more or less nigrescent; trochanters all flavous | 7. TROCHANTERATUS, <i>Hlg.</i> |
| (12). | 15. | Face immaculate black | 8. VULGARIS, <i>Holmgr.</i> |
| (11). | 16. | Scrobes simple; basal segment less elongate. | |
| (18). | 17. | Face transversely flavous in the centre or two-spotted | 9. SIGNATOR, <i>Grav.</i> |

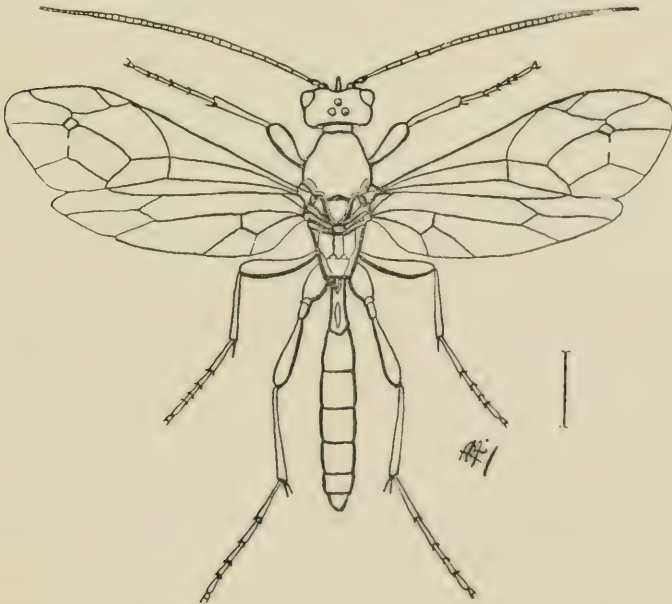


- (17). 18. Face immaculate black.
 (20). 19. Metanotal areae basally obsolete;
 hind tibiae black 10. NIGRIPES, *Holmgr.*
 (19). 20. Metanotal areae distinct; hind tibiae
 basally pale.
 (24). 21. Abdomen nitidulous and mainly red;
 clypeus not carinate.
 (23). 22. Frons strongly punctate; median
 nervure convergent 11. CONSOBRINUS, *Holmgr.*
 (22). 23. Frons finely punctate; *median ner-
 vure parallel 12. BRUNNIVENTRIS, *Grav.*
 (21). 24. Abdomen dull and black throughout;
 clypeus carinate 13. COMPUNCTOR, *Grav.*

1. elongator, *Fab.*

Ichneumon elongator, *Fab.* S. E. 1775, 337; *Jur. Nouv. Méth.* 110, ♂. *Tryphon elongator*, *Gr.* I. E. ii. 238; *cf.* i, Suppl. 689; *Beitr. Ent. Schles.* 1829, p. 8, pl. i, fig. 6; *Ste.* III. M. vii. 249; *Zett.* I. L. i. 383; *Holmgr. Sv. Ak. Handl.* 1855, p. 185; *Voll. Pinac.* pl. xxii, fig. 1; *Thoms. O. E.* ix. 896 et xii. 1256, ♂ ♀. *Monoblastus elongator*, *Htg.* *Wieg. Arch.* 1837, p. 155. *Var. T. ceratophorus*, *Thoms. O. E.* xii. 1256, ♂ ♀.

Somewhat shining and black, with a large frontal horn and the abdomen mainly flavescent. Head black and a little contracted posteriorly;



mouth alone usually rufescent; frons concave, centrally sulcate, dull and closely punctate or (*var. ceratophorus*) nearly glabrous, with an erect horn of varying length above the scrobes; face deplanate and strongly punctate; clypeus discreted and transversely carinate. Antennae somewhat shorter than the body, nigrescent, rufescent beneath, with scape

usually black. Thorax gibbous and as broad as head, with no notauli; mesonotum punctulate, with griseous pubescence; metathorax convex, gradually declived apically, with ten usually distinct areae of which the areola is elongate; spiracles suboval and usually large. Scutellum a little convex and laterally margined nearly to its abruptly declived apex. Abdomen almost petiolate, flavous or rarely red, with base more or less broadly and apex black; basal segment straight with spiracles a little before centre; second to fourth subparallel-sided. Legs flavidous or testaceous with their base, the hind and base of anterior femora, black; apices of hind tibiae more or less broadly concolorous; hind legs subelongate. Wings subflavescent; stigma always testaceous; nervellus intercepted at its centre. Length, 7—12 mm.

At once known by its erect and apically entire frontal process, elongate cheeks, obsolete petiolar carinae and usually flavidous abdomen. Thomson's var. is a small form with the frons much smoother and legs darker. I have seen four remarkable specimens, captured by Mr. Ernest A. Elliott in Inverness on 26th July, 1901, which have the frontal horn conical and gradually tapering to its apex, with all the tibiae almost white, the central segments deep red with the second suffused or didymated with black, and the nervellus intercepted far below its centre; this form is worthy of at least varietal rank, I term it var. *Elliotti*. He took the common form at Banchory and Ballater in September, 1910.

Abundant throughout nearly the whole of Europe from June to September; but nothing of its ecdysis is yet known. Hope took both sexes about Netley in Shropshire; it is recorded from London, Devonshire and Hampshire by Stephens; Dorsetshire by Dale; Yorkshire by Wilson (Yorks Nat. 1881, p. 153); Cornwall by Marquand; Norfolk by Bridgman; Wilts and south Wales by Marshall (coll.); and Scotland by James Wilson (Encycl. Brit. 7th ed. vol. ix, 1842). I have seen it from Cumberland, Sussex, Warwick, Cambs., Gloucestershire, Surrey, Lancashire, Edinburgh; Enniscorthy, Kilmore and Kenmare in Ireland, and Mr. Waterston took a female at Whiting Bay, Isle of Arran in September, 1903. It hardly ever seems to appear before the end of August in England, and is distinctly uncommon in Suffolk, where I have not seen it for ten years; nor does Bignell include it in his full Devon list. Those I have met with at Barnby Broad, Henstead, Dodnash and Bentley Woods, and Foxhall have invariably been sucking the flowers of *Angelica sylvestris*, between 11th and 26th September. Tuck has found it at Tostock in the same county and the var. *ceratophorus* on the coast at Aldeburgh.

2. *brachyacanthus*, Gmel.

Ichneumon brachyacanthus, Gmel. S. N. i. 2705, ♀. *I. testaceus*, Gmel. lib. cit. 2702 (nec Fab.), ♂. *Tryphon brachyacanthus*, Gr. I. E. ii. 242; Beitr. Ent. Schles. 1829, p. 11, pl. i, fig. 7; Ste. Ill. M. vii. 250; Zett. I. L. i. 388; Holmgr. Sv. Ak. Handl. 1855, p. 186; Voll. Pinac. pl. xxii, fig. 2; Thoms. O. E. ix. 896, ♂ ♀.

A shining species with abdomen and coxae fulvous, and frons cornuted. Head posteriorly constricted, black with mouth red; frons deplanate, sparsely punctate with a short, apically obtuse and excised horn above the scrobes; face slightly convex and punctate; clypeus short, subconvex and apically broadly rounded. Thorax almost narrower than head, with mesonotum sparsely but strongly punctate; metathorax high, short and

apically subtruncate, with the areae and areola obsolete, transverse costa strong. Scutellum margined and gradually elevated towards its apex. Abdomen immaculate fulvous throughout; first segment basally narrowed with central spiracles and weak carinae; terebra subexserted, infusate. Legs somewhat slender, fulvous with apices of hind femora and of their tibiae rarely infusate, their tarsi occasionally nigrescent. Wings somewhat clouded, areolet irregularly triangular; stigma infusate; nervellus intercepted in its centre. Length, 6—8 mm.

Known by its apically explanate and emarginate frontal process, very short cheeks, deplanate clypeus with its densely tomentose foveae, abruptly declived metathorax, and the entirely fulvous abdomen and coxae.

Both sexes are said to be common on umbelliferous flowers in Italy and Germany (Grav.), where Dalla Torre says Brischke bred this species from *Athalia spinarum*, doubtless a slip for Giraud's Austrian record from this host (Ann. Soc. Fr. 1877, p. 407); not infrequent in damp places in Sweden (Hlmgr.); France (Gaulle). With us it is certainly rare; Stephens thought it not common and records it from Darent Wood in June; Bignell captured it in south Devon at Bickleigh on 4th August and Shaugh Bridge on 17th August. I possess the specimen recorded (Entom. 1880, p. 88) from near Guildford by Dr. Capron, with three others from his collection; and Charbonnier has given me a male, taken by him in 1907 near Bristol. A couple in Marshall's collection are from Nunton in Wilts and Botusfleming in Cornwall.

3. *helophilus*, Grav.

Tryphon helophilus, Gr. I. E. ii. 284, ♂ ♀ (nec Holmgr., Thoms.). *T. bicornutus*, Holmgr. Sv. Ak. Handl. 1854, p. 76; lib. cit. 1855, p. 188; Brisch. Schr. Nat. Ges. Danz. 1878, p. 92; Thoms. O. E. ix. 896, ♂ ♀.

Shining and pubescent, with the mouth and clypeus alone flavescent; frons strongly nitidulous and very finely punctate, with no horn but the scrobes cornutely elevated internally. Metathorax smooth and shining, with the areae complete and costulae entire. Scutellum with weak longitudinal carinae. Abdomen shining and very finely punctate, black with segments one or two to four red; basal segment with carinae extending somewhat beyond its centre. Legs pale red with only base of coxae, apices of hind femora somewhat broadly and of their tibiae, black; trochanters immaculate red. Length, 6—8 mm.

At once known from the remainder of the genus, except *T. exclamationis*, by the peculiarly elevated inner edges of the scrobes, which represent two short horns when viewed from the vertex.

This species is not very uncommon in marshy places in August in north west Europe, though its distribution is hardly yet ascertained. It was found to be British in 1881 (Trans. Ent. Soc. p. 164) by Bridgman, who took it at Cringleford, Brundall and Felthorpe in Norfolk during July and August, adding that Capron had found it at Shere. I have never seen it in July and my earliest date is 17th August, 1900, when it was swept from *Spartanium ramosum*, growing in water at Foxhall; subsequently it occurs on the flowers of *Angelica* at Claydon and Finborough Park in Suffolk up to 20th September, when Tuck has also taken it at Tostock; it does not occur away from marshes and has not been bred. Elliott has sent it me from Banchory in the Highlands.

4. *exclamationis*, Grav.

Tryphon exclamationis, Gr. I. E. ii. 279, excl. ♀. *T. confinis*, Holmgr. Sv. Ak. Handl. 1854, p. 77; *lib. cit.* 1855, p. 191; Brisch. Phys. Ges. König. 1871, p. 88, ♂. *T. helophilus*, Thoms. O. E. ix. 899, ♂ ♀ (*nec* Grav.).

Pfankuch, in examining Gravenhorst's types, found that this species differs from *T. helophilus* only in its rugosely punctate and hardly shining frons, strong longitudinal scutellar carinae, finely rugose metathorax with no costulae, rather darker legs with basally infusate trochanters, flavous ♂ face, and in having the basal segment almost entirely and the two following basally scabriculous. Length, 7—8 mm.

So frequently taken with the above species both here and in Sweden that it is difficult to credit its distinction. Bridgman first noticed it in Britain (Trans. Ent. Soc. 1882, p. 158), at Brundall in September; and, although not since recorded, it is by no means rare in marshes on *Mentha hirsuta*, *Heracleum* and *Angelica* flowers, on rushes, and once I captured a male flying low among marram grass on the coast sandhills at Pakefield in Suffolk, where it has occurred to me from 17th August at Foxhall (on *Sparganium* with the last species), Lackford and at Metton in Norfolk, to early September, when Tuck has taken it at Tostock. I believe it to be local.

5. *ephippium*, Holmgr.

Tryphon rutilator, Gr. I. E. ii. 309, varr. 3 et 13, ♂ ♀. *T. ephippium*, Holmgr. Sv. Ak. Handl. 1855, p. 190, ♂ ♀; Voll. Pinac. pl. xxii, fig. 9, ♂; *cf.* Thoms. O. E. ix. 896. *T. atriceps*, Ste. Illus. Man. vii. 262, ♂.

A shining and black species, with the anus entirely red and metathorax glittering. Head not posteriorly contracted; the mutic frons and face strongly punctate; clypeus hardly elevated behind its centre, apically broadly rounded and, like the mandibles, rufescent. Antennae filiform, much shorter than body, testaceous beneath. Thorax stout, shining and almost narrower than head, notauli wanting; metathorax discally very strongly nitidulous, quite smooth and laterally foveate, with the petiolar area equally glabrous and shining, its basal carina strongly elevated and subreflexed; longitudinal carinae entirely wanting, the transverse strong and arcuate with costulae distinct; spiracles large and suboval. Scutellum punctate, deplanate and margined to apex. Abdomen parallel-sided, red with only its base black; basal segment black, with its apex red and carinae obsolete. Legs red with coxae, base of trochanters, anterior femoral marks and, except rarely in ♀, hind femora black; apices of their tibiae and tarsi rarely infusate; anterior tarsi and tibiae flavidous-red. Length, 9—12 mm.

At once known by the peculiar metathoracic structure, very similar to that of *T. brachyacanthus*, and so distinct that it doubtless constituted the feature upon which Förster's genus *Psilosage* was founded, though the present differs in no other way from more typical species of *Tryphon*. I have examined Stephens' type; but it would be ridiculous to concede him priority upon a feature not referred to in his description.

Doubtless not rare in north-west Europe, though hitherto known only by Gravenhorst's records, and from Sweden and France; Giraud once bred it from *Selandria* (*Periclista*) *melanocephala*, a common British sawfly.

With us *T. ephippium* is not very common, but extends from the Scots highlands to Kent, from 3rd July to 30th August only, in my experience. It was introduced by Bridgman (Entom. 1880, p. 54) and taken by him at Lakenham and Eaton in Norfolk: no one has subsequently noticed it in Britain. Most of my specimens were also captured in Norfolk, where Wainwright found it commonly in August, 1900, at West Runton; and I took it three years later about Cromer and Metton on flowers of *Heracleum sphondylium*. Tuck has occasionally met with it in Suffolk at Tostock. My other specimens are from Guestling in Sussex (Bloomfield); Dover and Ripple (Sladen); Shere (Capron); Ravenscar (Bingham); near London (Stephens); Nairn (Verbury); and Banchory (Elliott).

6. *rutilator*, Linn.

Ichneumon rutilator, Linn. F. S. ed. ii, 1761, 403; Fab. S. E. 335; Schr. En. 367; Rossi, F. E. ii. 49; Fab. Piez. 65; Jur. Nouv. Méth. 112, ♂; Gr. Mem. Ac. Sc. Torin. 1820, p. 381, ♂ ♀. *I. imprægnator*, Schr. En. 368; Vill. Linn. Ent. iii. 183; Oliv. Encyl. Méth. vii. 222, ♂. *I. cepae*, Fourc. E. P. ii. 421; Walck. F. P. ii. 68. *I. anodon*, Schr. F. B. ii. 287. *I. insultator*, Gr. Nov. Act. Acad. 1818, p. 285. *Tryphon rutilator*, Gr. I. E. ii. 305, excl. varr.; cf. i, Suppl. 692; Ste. Ill. M. vii. 261; Fonsc. Ann. Soc. Fr. 1849, p. 232; Holmgr. Sv. Ak. Handl. 1855, p. 186; Voll. Pinac. xxii, fig. 3; Thoms. O. E. ix. 896, ♂ ♀. *T. quadratus*, Ste. Ill. M. vii. 262, ♂. *Monoblastus rutilator*, Htg. Wieg. Arch. 1837, p. 155.

Shining, punctate and black with the mouth, clypeus and facial mark flavous. Head hardly constricted posteriorly; upper margin of scrobes auriculately dilated; frons mutic, carinulate, deeply impressed and rugosely substrate; face coarsely punctate, with at least a fascia or transverse mark flavous; clypeus sparsely punctate, ferrugineous and apically rounded. Antennae filiform, flavidous beneath. Thorax stout, coarsely punctate with infusate pubescence; metanotum somewhat smooth, costulae wanting, areola elongate, narrow subparallel-sided and somewhat smooth. Scutellum subelevated, margined to beyond its centre. Abdomen red, with its base alone black; basal segment somewhat narrow, apically glabrous, with carinae extending to its centre. Legs stout and black with apices of femora, the anterior tibiae and tarsi, red; hind tibiae testaceous towards their base; anterior coxae and trochanters only partly flavous. Length, 7—11 mm.

Extremely like *T. trochanteratus* and, with it, known from the remainder of the genus with auriculately elevated scrobes by its pale face. I have seen the type of *T. quadratus*.

This species is much less frequent than is generally supposed and there is something curiously spasmodic about its appearance that will not be explained till its hosts are known; I did not see it between 1900 and 1903, and between 1903 and 1908, though common in the years named; nor has it occurred to me since. It is found almost invariably upon the flowers of *Daucus carota* and *Heracleum sphondylium* from the time the latter first blossoms on 12th June till 25th July, though rarely also taken by sweeping grass and reeds, usually in open fields and hedges. It extends probably throughout Europe and is recorded from Dorsetshire, Norfolk, Cambs. and Sussex, though apparently rarer in the west where Marshall and Bignell did not find it. My fifty specimens are from Hampshire (Miss Chawner), Surrey (Capron), Herts (Piffard), Gloucester (Charbonnier), Suffolk (Tuck), London (Brunetti), Shropshire (Hope), Lines. and

Notts (Thornley), Northants (Morley), Cumberland (Tomlin), Yorks (Elliott); Kings Cross in Arran, Bishopton, Crookston, Cambuslang and Barr in Ayrshire (Dalglish).

7. *trochanteratus*, Holmgr.

Tryphon rutilator, Gr. I. E. ii. 308, varr. 1 et 2. *T. trochanteratus*, Holmgr. Sv. Ak. Handl. 1855, p. 187; Brisch. Phys. Ges. König. 1871, p. 88; Schr. Nat. Ges. Danz. 1878, p. 92; Voll. Pinac. pl. xxii, fig. 5; Thoms. O. E. ix. 896, ♂ ♀

Shining, punctate and black with the mouth, clypeus and face flavous. Differing from *T. rutilator* in having the:—Frons mutic, very obsoletely carinulate and not at all striate; metanotum with costulae entire and areola subelongate; abdomen black with segments two to four alone red, and the anal ones white-margined; basal segment apically only somewhat smooth, with carinae extending to a little beyond its centre; apices of coxae, whole of trochanters and base of hind tibiae, stramineous or testaceous. Length, 8—10 mm.

This species is extremely like *T. rutilator* and is probably no more than a variety; but with the frons although coarsely and deeply punctate-rugose not striate, the metanotal costulae entire, anterior femora red, the hind trochanters always entirely pale, and anus at least subnigrescent.

Its distribution is probably as wide as that of *T. rutilator*, though only recorded on the Continent from Sweden, Germany, Holland and France; with us it appears to be even broader, though rarer—my twenty-three specimens and other records show a distribution through Hampshire (Adams), Sussex (Bloomfield), Surrey (Capron), Kent (E. Saunders), London (Brunetti), Suffolk (Tuck), Norfolk (Bridgman), Devon (Parfitt and Marshall), Cornwall (Marquand), to Loo Bridge in Co. Kerry and Nairn (Yerbury), Bishopston (Dalglish), Skene (Elliott), Aberdeen (Bloomfield), Rannoch and Govilon in South Wales (Marshall). It appears to be abroad longer than *T. rutilator*, since I possess specimens taken by Saunders at Dover in May, 1872, and in Scotland on 7th August, 1909, by Elliott. But that it is distinct from that species I cannot credit, since I have invariably taken them together, often upon the same flower-table of *Heracleum*, upon which it has invariably occurred to me at Moulton, Barham (misnamed *T. rutilator* at E. M. M. 1897, p. 267), Bramford and Monk's Soham, in Suffolk.

8. *vulgaris*, Holmgr.

Tryphon rutilator, varr. 5, 6, 8, Gr. I. E. ii. 310, ♂ ♀. *T. vulgaris*, Holmgr. Sv. Ak. Handl. 1855, p. 186; Voll. Pinac. pl. xxii, fig. 4; Brisch. Phys. Ges. König. 1871, p. 87, varr. 1—3; Schr. Nat. Ges. Danz. 1878, p. 92; Thoms. O. E. ix. 896, ♂ ♀.

Shining, punctulate and black, with mouth and apex of clypeus pale; frons rugosely punctate and very obsoletely sulcate centrally. Antennae flavous beneath; metanotal areae complete, with the areola elongate and apically subdilated. Abdomen red with only the first segment black; basal segment somewhat narrow, with its apical margin nearly smooth and carinae extending a little beyond its centre. Legs red, with the tibiae externally paler, and hind legs mainly black. Length, 8—11 mm.

Very like the preceding but with the frons not at all striate, strongly impressed above the scrobes and its central sulcus obsolete, the metanotal areae usually entire and face entirely black; from *T. braccatus*, Gr., Holmgren says it differs in having the anterior legs red, not pale stramineous, but I do not think he knew the true *T. braccatus*, which Pfankuch assigns to *Psilosage* with no longitudinal metanotal areae, since he says the areae are more or less complete. *T. braccatus* was introduced as British by Marshall, doubtless on the strength of a single ♂ of Holmgren's species taken at Nunton in Wilts, and, since no one has found the true species, represented in Gravenhorst's collection by a broken ♂, it must be omitted from our List.

Not a very common species with us, though its Continental distribution is broad. It has been found in the New Forest (Miss Chawner), Shere (Capron), Yorks (Bradford Sc. Journ. 1908, p. 71), Nunton (Marshall) and Norwich (Bridgman); I have found it on 6th June on flowers of *Chacrophyllum sylvestre*, later on those of *Heracleum*, towards which I noticed that they dart very swiftly and are not seen till they hover quite close to the flower, upon which they alight gently on the under side and then clamber up onto the flower-table; later still they frequent *Angelica*, up to 22nd August. I have found it at Epsom, Lyndhurst and Hinchelsea in the New Forest, where a male was taken by Lyle, flying low over heather in the evening; at Wroxall in Isle of Wight; and at Lackford, Hadleigh, Monks' Soham, and Wherstead in Suffolk. Yerbury took it at Glengariff in Co. Kerry in June, 1901 (misnamed *T. braccatus*, E.M.M. 1902, p. 55); and Elliott has given me both sexes from Skene Park and Banchory in the Highlands, taken in August.

9. *signator*, Grav.

Tryphon rutilator, var. 4, Gr. I. E. ii. 309, ♂. *T. signator*, Gr. *lib. cit.* 301; Ste. Ill. M. vii. 261; Holmgr. Sv. Ak. Handl. 1855, p. 189; Voll. Pinac. pl. xxii, fig. 7; Thoms. O. E. ix. 898, ♂ ♀. *T. facialis*, Ste. Ill. M. vii. 263, ♂.

Somewhat shining and black with mouth, apex of clypeus and a transverse central fascia, often centrally interrupted, on the face flavous; clypeus transversely elevated behind its centre; frons very closely and subrugosely punctate. Antennae flavidous beneath. Metanotum with three or five distinct areae. Abdomen red, with the first segment black and anus often infuscate; basal segment somewhat narrow, with the carinae very determinate and extending beyond its centre. Legs testaceous with coxae, base of trochanters and apices of hind tibiae black. Areolet petiolate and subtransverse. Length, 7—10 mm.

Superficially not to be distinguished from *T. rutilator*, but at once known by the simple scrobes and from all the remainder of the genus by the peculiar facial fascia, often centrally interrupted and so forming two dots below the antennae. My only Scots specimen is a ♂, taken by Mr. Adie Dalglish at Cadder in Lanark on 10th June, 1900, and is remarkable in having these facial marks linear and oblique. I have seen the type of *T. facialis*.

One of our commonest species, occurring earlier than is usual in this genus; it is almost confined to June, my earliest date is 27th May, and it is not found after the first week in July; I have never seen it attracted by flowers and my forty odd specimens were met with by sweeping grass and

bushes. It has been found in Cornwall (Marquand), Devon (Bignell), Gloucester and Somerset (Charbonnier), Hants (Miss Chawner), Isle of Wight and Northants (Morley), Sussex (Bloomfield), Surrey (Capron), London (Brunetti), Herts (Piffard), Hereford (Yerbury, E.M.M. 1902, p. 55), Stafford (Tomlin), Shropshire (Beaumont), Worcester (Fletcher), Suffolk (Tuck), Norfolk (Bridgman), Notts and Lincs. (Thornley); but it appears rarer further north and is only once mentioned from Yorks (Porritt, Yorks. Nat. 1882, p. 57); Marshall has given it me from south Wales.

This species has not been bred on the Continent, and Mr. J. E. Fletcher's excellent account of its economy (E.M.M. 1889, p. 400) appears to have eluded subsequent notice:—In March, 1885, he took three and a half inches of decayed wood from a willow, crowded with cocoons of the fossor, *Crabro leucostoma*, Linn. Therefrom emerged during the following May and June twenty-seven specimens of the host with a small Tachinid fly and a single *T. signator*. Careful investigation showed twenty-nine vacated cocoons, of which that from which the *Tryphon* emerged was perforated at the anal extremity and contained its own exuviae. He adds that when found the hosts' cocoons were so close to the exposed surface of the wood as to offer no obstacle to the parasite's oviposition, supposing it were the cocoon that was attacked.

10. *nigripes*, Holmgr.

Tryphon rutilator, var. 11, Gr. I. E. ii. 313, ♂. *T. nigripes*, Holmgr, Sv. Ak. Handl. 1855, p. 189, ♀; Thoms. O. E. ix. 898, ♂ ♀.

Shining and black, with only the mouth and sometimes apex of clypeus piceous; face black and subconvex with griseous pilosity; clypeus transversely elevated behind its centre, and apically nearly smooth; frons closely punctate and apically impressed; ♂ palpi stramineous. Antennae black, and hardly paler in ♀ beneath. Metanotum with at most three very obsolete areae, and all costae weak. Scutellum somewhat smooth and laterally margined to beyond its centre. Abdomen shining, very finely and obsoletely punctate; basal segment black and sparsely punctulate, margined, with weak carinae hardly extending beyond its centre; four following segments and the hypopygium red, the two apical in ♀ white-margined; terebra red and somewhat short. Anterior legs alone pale with coxae, trochanters and base of femora black; hind tarsi infuscate. Tegulae black and radix stramineous; areolet small, irregular and petiolate. Length, 6—9 mm.

Known from its congeners with simple scrobes and black hind femora by its obsolete basal metanotal areae and entirely black hind tibiae.

Apparently very rare and perhaps no more than a variety of the following. Gravenhorst knew two German males, Holmgren knew two Swedish females, Tosquinet records it (Ann. Soc. Ent. Belg. 1890, p. 91) from Belgium, and Gaulle from France. In Marshall's collection are four males from Bugbrooke in Northants and Swanage; I possess two males of the maximum size, captured by Tuck, probably upon flowers, at Tostock in Suffolk, during July, 1899 and 1900.

11. *consobrinus*, Holmgr.

Tryphon consobrinus, Holmgr. Sv. Ak. Handl. 1855, p. 188, ♂ ♀, excl. synonym.; Brisch. Schr. Nat. Ges. Danz. 1878, p. 92; Voll. Pinac. pl. xxii, fig. 6; Thoms. O. E. ix. 898, ♂ ♀.

Very similar to *T. nigripes*, but rather less nitidulous with the facial pilosity infusate, frons more strongly and closely punctate, clypeus but slightly convex basally; antennae apically pale beneath; metanotal areae always complete, rugose, with areola elongate and laterally parallel; scutellum deplanate, and laterally margined to its centre; segments two to four only usually red, and in ♂ somewhat dull; basal segment punctate, subimmarginate, with carinae extending beyond its centre; hind tibiae pale, with their apices alone nigrescent. Length, 6—10 mm.

Not uncommon on the Continent from Sweden to France and bred by Brischke in Prussia from a *Dolerus* larva. Rev. T. A. Marshall possessed specimens from Nunton in Wilts and Govilon in south Wales. Capron took a full series in at Shere, Beaumont found it at Chobham Surrey, Thornley at Tresswell and South Leverton in Notts and Kelsey in Lincs., Miss Chawner several in the New Forest, where alone it has occurred to me at Matley Bog and Lyndhurst, and Rev. E. N. Bloomfield has given me a male named by Bridgman from Guestling in Sussex. I have no records from the northern counties.

12. *brunniventris*, Grav.

Tryphon brunniventris, Gr. I. E. ii. 281; Holmgr. Sv. Ak. Handl. 1854, p. 76; lib. cit. 1855, p. 190, pl. viii, fig. 11; Brisch. Schr. Nat. Ges. Danz. 1878, p. 93; Thoms. O. E. ix. 899, excl. syn.; ♂ ♀. Var. *Tryphon rutilator*, Gr. I. E. ii. 312, varr. 9, ♀ et 10, ♂; *T. incestus*, Holmgr. Sv. Ak. Handl. 1855, p. 188; Brisch. Schr. Nat. Ges. Danz. 1878, p. 92; Thoms. O. E. ix. 898, ♂ ♀.

This species differs from the last two in its much finer and more diffuse frontal punctation, in its mainly rufescent hind tibiae, more strongly convex clypeus and distinctly margined basal segment; the metanotal areae are basally entire; and Thomson adds that the median nervure is parallel with the posterior in this species, whereas it is basally convergent therewith in *T. consobrinus*, which has the epicnemial emarginate and female valvulae black, while in the present species the former is centrally entire and the latter flavous. Length, 6—9 mm.

As broadly distributed as the last species and not easy to distinguish therefrom. With us its distribution is much broader, though it has not been mentioned since introduced by Marshall, who possessed no specimens, in 1870. I have examples captured at Cannock Chase in June by Tomlin, at Cadney in Lincs. by Thornley, at Tostock in Suffolk in June and July by Tuck, at Glengariff in Co. Kerry in June, 1901, by Yerbury; at Ballater, Banchory and Birnam in Perth in August by Elliott; and at Whiting Bay in the Isle of Arran in September, 1903, by Waterston. I have taken but a single pair; the female was investigating flowers of the blue wild hyacinth in Bentley Woods on 26th May, 1904, and the male was upon the flowers of *Eupatorium cannabinum* on 14th June, 1900, at Glemsford in Suffolk. Another was sucking *Heracleum* in my paddock at Monks' Soham in July, 1908. That the female of this species is at least locally most constant in colouration and frontal sculp-

ture I am able to attest through the remarkable capture of twenty specimens among many more seen flying about and settling upon the sacred door and door-posts of the chapel upon the extreme top of Croagh Patrick in Co. Mayo (whence St. Patrick is still locally believed to have banished snakes from Ireland); the sun was at meridian heat and one must suppose the insects to have been drawn up by some air current to this altitude of 2,510 feet, for no attraction was apparent, and their normal habitat was doubtless the boggy peat pools but little above sea level, where I swept it from reeds at the adjacent Carramore Lake a few days later, on 18th July, 1910.

I describe the varietal form above since it is much commoner than the type, which differs from all the foregoing species in its red hind femora and simple scrobes. Pfankuch gives a good table of the species with red hind femora and regards both *T. consobrinus* and *T. incestus*, Holmgr., as little more than varieties of *T. brunniventris*, Gr.; he makes, however, no mention of frontal puncturation, by which the former is at once recognised from the two latter and these are certainly synonymous, since the whole sculpture and facies are identical, though I have seen no intermediate forms.

T. brunniventris has long stood in our List, but I can find no records of capture and it is certainly rare, much more so than its variety. I possess but half a dozen examples, captured at Irvine Moor near Glasgow by DalGLISH, and at Tostock with var. *incestus* in July by Tuck; it has occurred to me on Angelica flowers at Lackford and on those of wild carrot at Tuddenham in Suffolk, at the end of August.

13. compunctor, Grav.

Tryphon compunctor, Gr. I. E. ii. 130 (*nec* Linn.); Ste. Ill. M. vii. 232; Fonsc. Ann. Soc. Fr. 1849, p. 216; Holmgr. Sv. Ak. Handl. 1854, p. 79; l. c. 1855, p. 192, ♂ ♀; cf. Thoms. O.E. ix. 898.

A black species, with the mouth and usually clypeal apex rufescent; clypeus transversely subcarinate centrally, frons deplanate and strongly punctate. Antennae rufescent towards their apices beneath. Metanotal areae strong and entire, with distinct costulae. Abdomen black with only apical margins of the segments very narrowly castaneous; basal segment not broad, slightly depressed before its apex, with distinct and basally strong discal carinae extending to its centre; terebra narrow. Legs red, with only coxae and apices of hind tibiae black. Areolet usually a little petiolate, emitting recurrent nervure from its extreme apex; nervellus strongly postfurcal, intercepted a little above its centre. Length, 7—10 mm.

The only British species of the genus with black abdomen and known, as Pfankuch says of the type, by the broad stigma and straight second recurrent nervure which is emitted from the apical angle of the areolet.

It is found somewhat uncommonly on the Continent among oaks in May. "Taken, but very rarely, near London, in June" (Stephens, whose only example now extant is a ♀ *Mesoleius*; there are with it in Mus. Brit., however, half a dozen examples correctly named by Desvignes). It is undoubtedly very infrequent with us, and there are no later records; I am, nevertheless, able to confirm it as British by the capture of an example on bushes on 27th June, 1900, in the Bentley Woods near Ipswich, the only one taken during a ten years research of the same spot.

OTOBLASTUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 201; Thoms. O. E. ix. 895.

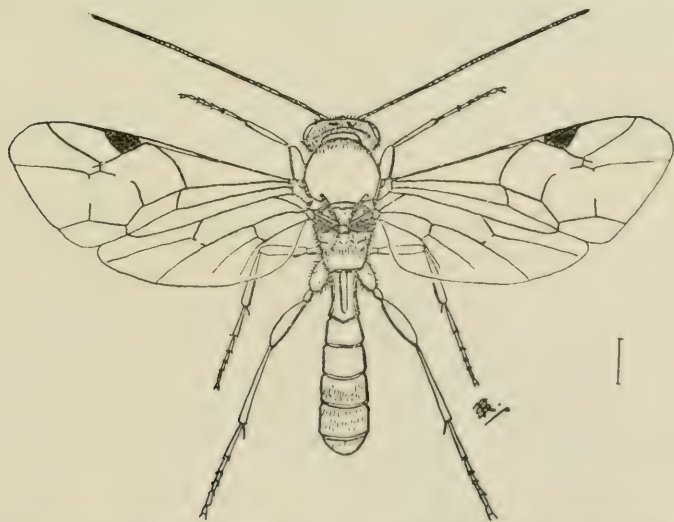
Clypeus slightly excavate discally; eyes not internally emarginate. Metathoracic areae complete. Abdomen sessile and apically clavate; first segment acutely dentate on either side at its base, and discally bicarinate. Legs stout; tibial calcaria distinct; tarsal claws mutic. Areolet oblique, subsessile; stigma broad; nervellus opposite and intercepted hardly below its centre.

Unique in its basally auriculate petiole; it has the facies of *Cteniscus*, in which genus it has hitherto stood in our Catalogue, though Marshall has marked our single species (in MS.) "Not *Cteniscus* but *Tryphon*." We possess the only palaearctic species, though several others are described under this genus by Davis from America.

1. luteomarginatus, Grav.

Tryphon luteomarginatus, Gr. I. E. ii. 146, ♀. *Otoblastus luteomarginatus*, Thoms. O. E. ix. 900, ♀.

A small and stout black species with the mouth, clypeus, face, frontal orbits and underside of the filiform antennae, flavous. Thorax stout, short and strongly convex, with the scutellum large and the fully areated



metathorax abruptly declived apically. Abdomen stout and apically subtruncate, black with apices of all the basally constricted segments narrowly flavidous; basal segment margined, evenly punctate and laterally subparallel; terebra slightly exerted, ♂ valvulae large. Legs short and stout, stramineous with the anterior basally testaceous; hind coxae, trochanters, femora and apices of the whitish tibiae, deep black. Length, 5—6 mm. ♂ ♀.

Gravenhorst knew three specimens from Gottingen, Breslau in June and Geneva; Thomson knew two from Sweden and Oland Island; and Gaulle records it from France. It is no doubt rare with us, or at least very local; Nunton in Wilts (Marshall) and Norwich (Bridgman). I have a full series in Dr. Capron's collection from Shere in Surrey; and Piffard used to take it at Felden in Herts, two of his specimens are labelled 18th and 26th June, 1899 and 1900. Desvignes also had two British specimens.

SUB-TRIBE

CTENISCINI.

Known from the whole of the Ichneumonidae by having no hind tibial calcaria.

In the Jahresberichte über die Fortschritte der Forstwissenschaft und forstlichen Naturkunde nebst original-Abhandlungen aus dem Gebiete dieser Wissenschaften, 1838, pp. 270-71, Hartig wrote "Among the Ichneumons, the genus *Tryphon* certainly contains the largest number of species which feed on the sawfly larvae. Those species which have no terminal spines on the hind tibiae and only one on the middle tibiae I unite in the subgenus *Exenterus*. In my collection are seventeen species here-belonging." At p. 310, he has a further note dated May, 1838. This, then, is certainly earlier than Haliday's erection of his "subgenus *Cteniscus*, Curt. Guide, No. 492 bis:—Tibiarum Calcaria 1:1:0. Characteres reliqui subg. *Tryphon*," in the Ann. Nat. Hist., October, 1838. And in one of his MS. notebooks, preserved in the Dublin Museum, I have seen an entry synonymising his genus with *Exenterus*, Htg. In all respects but that of the calcaria these insects are inseparable from the Tryphonini, though the head is usually buccate, tumidous and the abdomen subfusiform.

Table of Genera.

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|-------|---|------------------------------|
| (10). | 1. Basal segment with lateral margin simple, not sinuate. | |
| (3). | 2. Head and thorax densely pubescent; abdomen subpetiolate | EXYSTON, <i>Schiöd.</i> |
| (2). | 3. Head and thorax sparsely pubescent; abdomen subsessile. | |
| (5). | 4. Lower mandibular tooth very distinctly the longer | ACROTOMUS, <i>Holmgr.</i> |
| (4). | 5. Mandibular teeth of equal length. | |
| (7). | 6. Hind tibia with minute calcar; ventral valvulae cultriform | SMICROPECTRUS, <i>Thoms.</i> |
| (6). | 7. Hind tibia with no calcar; ventral valvulae not cultriform. | |
| (9). | 8. Second segment impressed; valvulae geniculately compressed | DIABORUS, <i>Först.</i> |
| (8). | 9. Second segment not impressed; ventral valvulae simple | EXENTERUS, <i>Htg.</i> |
| (1). | 10. Basal segment with its lateral margin trisinate | TRICAMPTUS, <i>Först.</i> |

EXYSTON, *Schiödde*.Schiöd. Guér. Mag. Zool. 1839, Ins. p. 12, *nota*.

Head subbuccate and elongately pubescent; clypeus arcuately discreted and a little elevated; mandibular teeth acute and of equal length. Thorax distinctly pubescent with the epicnemial elevated behind the front coxae. Abdomen clavate; first segment narrow and basally strongly dilated, with its spiracles central. Legs slender with the tarsal claws simple and the intermediate tibiae unicalcarate.

The species of this genus, which occur in grassy and especially dry, sunny places, are at once recognized by the strongly pubescent head and thorax, clavate abdomen, strongly dilated first segment and the unpectinate claws. About a score have been described, for the most part from North America, though Thomson has separated several from the type of the genus, which alone has hitherto been supposed to occur in Britain. Two are of doubtful occurrence.*

Table of Species.

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|------|--|--------------------------------|
| (2). | 1. Basal segment elongate, postpetiole twice longer than broad | 1. CINCTULUM, <i>Grav.</i> |
| (1). | 2. Basal segment short, postpetiole not twice longer than broad. | |
| (4). | 3. Face white-marked; abdomen mainly red | 2. BREVIPETIOLATUM, <i>Th.</i> |
| (3). | 4. Face entirely black; abdomen not red-marked | 3. SUBNITIDUM, <i>Grav.</i> |

1. *cinctulum*, *Grav.*

Ichneumon cinctulus, Gr. Mem. Ac. Sc. Torin. 1820, p. 359, ♂. *Mesoleptus cinctulus*, Gr. I. E. ii. 37; Ste. Ill. M. vii. 218, ♂. *Exyston cinctulus*, Holmgr. Sv. Ak. Handl. 1854, p. 73, ♂; *lib. cit.* 1855, p. 246; Voll. Schets. I, pl. iii, fig. 21; Thoms. O. E. ix. 882, ♂ ♀.

Head subbuccate and scarcely constricted posteriorly; clypeus discreted. Antennae somewhat shorter than body. Metathorax rugose with five areae; pleurae diffusely punctate; scutellum elevated and api-

* EXYSTON ALBOCINCTUS, *Grav.*

Ichneumon albocinctus, Gr. Mem. Ac. Sc. Torin. 1820, p. 375, ♂. *Tryphon albocinctus*, Gr. I. E. ii. 204; Ste. Ill. M. vii. 245; Fonsc. Ann. Soc. Fr. 1849, p. 223, ♂. *Exyston albocinctus*, Pfank. Zeits. Hym. Dip. 1906, p. 222.

An elongately white-pubescent species. Face black with the palpi, centre of mandibles and apex of clypeus flavous; antennae as long as body, piceous with the under side ferrugineous; metathoracic areae indistinct, with areola broad and transversely rugose; spiracles oval. Scutellum apically red. Abdomen red with its base black, and margins of the segments whitish; first segment deeply foveate and auriculate basally; anterior legs flavous; hind ones black with tibiae centrally and femora apically flavous; anterior femora laterally infusate; areolet irregularly subpetiolate. Length, 9 mm.

Larger and stouter than *E. cinctulum*, with thorax somewhat more coarsely punctate.

Gravenhorst had but two Italian males and de Fonscolombe records it from Aix. Stephens claims to have taken the species rarely at Darenth Wood in July; but his specimens, now in the British Museum, are referable to *E. brevipetiolatum*.

EXYSTON TRICOLOR, *Grav.*

Tryphon tricolor, Gr. I. E. ii. 207; Ste. Ill. M. vii. 246, ♂. *Exyston tricolor*, Pfank. Zeits. Hym. Dip. 1906, p. 223.

This species is very closely allied to *E. cinctulum* in its elongate basal segment, etc., but may at once be known by its great size of 11 mm. No one recognised it from 1829 to 1906, when Pfankuch found the single male type from Frankfort to belong to the present genus, except Stephens, who professes to have found it both at Darenth Wood and the New Forest rarely in June. A great deal more evidence is requisite to include either this or the above species in our Fauna.

cally depressed. Abdomen oblong-fusiform, apically subacuminate; basal segment narrow with the postpetiole twice longer than broad, apically scarcely explanate and carinate almost to its apex; second segment narrow and basally scabriculous with distinct thyridii.

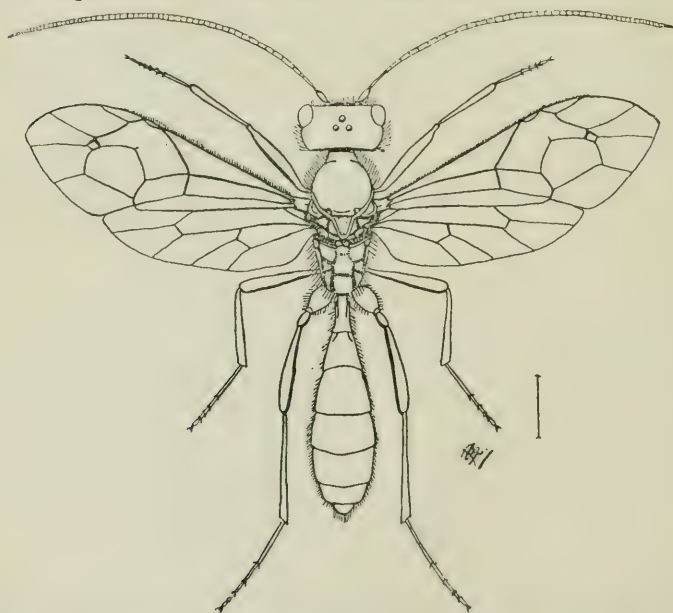
Black with the face anteriorly, and apex of scutellum usually, flavous; abdomen, excluding basal segment and sometimes the basal half of the following, fulvous with anus paler. Anterior legs testaceous with trochanters paler; hind ones rufescent with apices of the femora and tibiae, a band before base of latter and often the extreme base of the former black. Length, 7—9 mm.

This is not a rare species in Britain, though I have not taken it since 1900, when Mr. W. H. Tuck and I found it in Suffolk during June and July by sweeping long grass both in dry and wet places at Tostock, Farnham and Aldeburgh. It is widely distributed with us and occurs on the Continent, where Gaulle records it as preying upon a species of *Emphytus*, as late as October. Taken rarely in Darent Wood at the end of June (Stephens); not uncommon in Norfolk (Bridgman); Bickleigh and Bolt Head, Devon, in June (Bignell); several at Tarn Lodge, ten miles from Carlisle, early in July, 1900 (Routledge); Hastings (Vict. Hist.); Shere (Capron); Devon (Edmonds); Wyre Forest, middle of June, 1903 (Martineau).

2. *brevipetiolatum*, Thoms.

Tryphon triangulatorius, var. 1, Gr. I. E. ii. 205, ♂. *Exenterus triangulatorius*, Holmgr. Sv. Ak. Handl. 1855, p. 235, ♂ ♀. *Exyston brevipetiolatus*, Thoms. O. E. ix. 883, ♂ ♀.

A black species with the face white-marked and the abdomen except



basally, with the anterior legs, rufescent. Genal costa apically sinuate and dilated; postpetiolar carinae nearly wanting, basal segment short;

stigma broad, nervellus elongately antefurcal; calcaria mutic, claws simple. Length, $5-6\frac{1}{2}$ mm.

At once known from *E. cinctulum* by the much shorter basal segment.

This is the species recorded as British by Bridgman (Trans. Ent. Soc. 1884, p. 432) under the name *Cteniscus triangulariorius*, Grav.; but, since he refers to Gravenhorst's variety only and undoubtedly named the insect captured by Bignell, in the vicinity of Plymouth, from Holmgren's monograph, it must be known under the above name. Gravenhorst says it occurs in May, but the specimen taken by Bignell at Horrabridge, was found at the end of June; Atmore subsequently took several at Kings Lynn in Norfolk; and I possess four captured by Beaumont at Plumstead, late in May, 1897, by Stanley Edwards at Lynton in Devon in 1890, by Col. Yerbury at Golspie in Scotland on 15th August, 1900, and myself took a male in the New Forest on 13th August, 1901, in Denny Wood. It was not uncommon on birch trees in Tuddenham Fen on 6th June, 1910; Champion took a female at Aviemore in 1876, and Piffard found a remarkable little male of only 4 mm. late in June, 1900, at Felden in Hertfordshire. It is abundant at Wimbledon in June.

3. subnitidum, Grav.

Tryphon subnitidus, Gr. I. E. ii. 144; Ste. Ill. M. vii. 234, ♂. *Exyston subnitidus*, Pfank. Zeits. Hym. Dip. 1906, p. 90, ♂.

Mouth flavous with mandibles at base and apex, and part of clypeus, black. Antennae filiform, pale fulvous beneath, with the three basal joints entirely black. Abdomen black, with basal segment immaculate and sulcate; remainder apically flavescent, with the fourth to sixth also laterally badius. Legs black with the anterior femora dull stramineous below, and their tibiae and tarsi paler. Wings subhyaline; the broad stigma and tegulae black, radix stramineous; areola irregular and subpetiolate; nervellus antefurcal and intercepted below its centre. Length, 5 mm.

Marshall placed this *Tryphon* in *Cteniscus*, doubtless, on the strength of its author's comparison with *E. cinctulum*; it has since been lost sight of, till Pfankuch recently found the type to belong to this genus on account of its equal teeth, and the capital and petiolar structure. It is allied to *E. brevipetiolatum* in its short basal segment; but is unknown to me, excepting in a somewhat poor though apparently correctly-named example from Desvignes' collection in Mus. Brit.

Gravenhorst knew but a single male, taken by Sturm near Nürnberg. We have nothing but the above specimen, and Stephens' record to place it in our fauna: "Found at the Hermitage in August, and in other places within the metropolitan district; apparently not common."

ACROTOMUS, Holmgren.

Holmgr. Sv. Ak. Handl. 1855, p. 222.

Head somewhat tumidulous and shortly pubescent; clypeus more or less convex, not deeply discreted and generally truncate; mandibular teeth stout with the lower distinctly the longer. Thorax stout and obsoletely pubescent; metathorax short with entire areae. Abdomen oblong-fusiform with the first segment narrow but not basally dilated. Legs normal with no hind calcaria. Areolet usually entire. N

The only genus of this group with the lower mandibular tooth distinctly the longer, since in all the following genera it is of equal length with the upper. The species are found in woods, and oviposit in Hymenopterous larvae; they are very nearly confined to the Palearctic region, as far as is at present known.*

Table of Species.

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|-------|---|--------------------------|
| (4). | 1. Antennae entirely black; clypeus apically rounded. | |
| (3). | 2. Face and central segments entirely black | 1. ALACER, Grav. |
| (2). | 3. Face and apices of central segments broadly pale | 2. RIDIBUNDUS, Grav. |
| (1). | 4. Antennae not entirely black; clypeus apically subtruncate. | |
| (12). | 5. Nervellus intercepted below centre; genal costa simple. | |
| (7). | 6. Clypeus not transverse, apically subemarginate | 3. LUCIDULUS, Grav. |
| (6). | 7. Clypeus transverse, apically subtruncate. | |
| (9). | 8. Abdomen centrally rufescent; cheeks buccate | 4. LATICEPS, Grav. |
| (8). | 9. Abdomen not red-marked; cheeks not buccate. | |
| (11). | 10. Face laterally pale; thorax immaculate | 5. SEXCINCTUS, Grav. |
| (10). | 11. Face entirely pale; thorax flavidous-marked | 6. SUCCINCTUS, Grav. |
| (5). | 12. Nervellus intercepted in centre; cheeks dentate below | 7. MESOLEPTOIDES, Steph. |

1. *alacer*, Grav.

Tryphon alacer, Gr. I. E. ii. 132; Ste. Ill. M. vii. 233, ♂. *T. anceps*, Ste. lib. cit. 243. *Acrotomus xanthopus*, Holmgr. Sv. Ak. Handl. 1855. p. 223; Brisch. Schr. Nat. Ges. Danz. 1878, p. 103, ♂. *A. alacer*, Pfank. Zeits. Hym. Dip. 1906, p. 86.

A nitidulous black species. Head scarcely constricted posteriorly; black with the palpi and mandibles except at their apices pale; clypeus slightly convex and apically rounded. Thorax stout with the apically flavidous scutellum elevated and the pleurae obsoletely punctate. Abdomen narrow, somewhat longer than head and thorax, black with the anal segments apically pale; basal segment narrow and scarcely explanate apically; the second and third glabrous and convex, remainder subpubescent. Legs elongate and slender, rufescent with the posterior

*ACROTOMUS LAETUS, Grav.

Mesoleptus laetus, Gr. I. E. ii. 50; Ste. Ill. M. vii. 219. *Exenterus orbitatorius*, Schiöd. Guér. Mag. 1839, p. 11, nota. *Acrotomus orbitatorius*, Brisch. Phys. Ges. Königl. 1871, p. 97; Schr. Nat. Ges. Danz. 1878, p. 103, ♂ ♀; Voll. Pinac. pl. xl, fig. 2.

This is said by Pfankuch in 1906 to be the true synonymy of *Mesoleptus laetus*; but since it is known as British upon no higher authority than Stephens (1835) and has not since been noticed with us, we must regard his record from "Coombe Wood in July" as extremely doubtful, till further evidence be forthcoming. Pfankuch adds that *T. cephalotes*, Grav., is synonymous with this species; but all the specimens so named in the National collection are referable to *Cteniscus*, having equal mandibles,

tibiae and tarsi mainly infuscate. Radial nervure straight or slightly curved apically. Length, 7—8 mm.

[The following description of *T. anceps*, drawn direct from Stephens, will show it to be almost indubitably synonymous :—

A black and flavous species, with the abdomen not red and the face entirely black. Head somewhat large and broad; mouth and palpi fulvous, with mandibles apically black; labrum with two fulvous spots. Antennae somewhat short and stout, entirely deep black. Thorax immaculate black. Scutellum pale flavous, with a faint concolorous line below it. Abdomen elongate, clavate, nitidulous, pubescent and black with all the segments apically stramineous-margined, except the first which is whitish-marked on either side of the black apex. Legs fulvous with only the hind tarsi and tibiae infuscate, the latter basally rufescent. Wings ample and hyaline; areolet irregular and petiolate. Length, 7 mm.

“Taken near Hertford, in July” (Stephens).]

The strikingly nitidulous and elongate black body, contrasting with the long, pale legs, renders it a conspicuous insect. This species has the basal segment narrow throughout; but I possess a specimen, apparently undescribed, with the first segment hardly longer than broad and its spiracles more prominent than in any Ichneumonid with which I am acquainted; the latter was taken by Mr. Philip de la Garde at Lydford in September, 1891.

This species was originally described from Austria and is said by Holmgren to be commonest in marshy places. It is certainly rare with us and I have seen but a single ♀, captured by Piffard at Felden in Herts. “Taken in June in the vicinity of the metropolis” (Stephens); and again in 1873 at the end of October near Worcester (Bridg. Trans. Ent. Soc. 1886, p. 364).

2. *ridibundus*, Grav.

Tryphon ridibundus, Gr. I. E. ii. 188, ♂. *Acrotomus ridibundus*, Pfank. Zeits. Hym.-Dip. 1906, p. 219.

A pubescent, black species. Mouth, clypeus, genal and two large facial marks, flavous. Callosities before and lines beneath radices flavous. Scutellum apically, and postscutellum transversely, flavous. Abdomen nitidulous and impunctate with the segments, especially the transverse second and third, apically flavous-margined; suture of second and third segments constricted. Anterior legs, posterior trochanters and base of the stout, infuscate hind tibiae, flavous; anterior femora infuscate beneath; hind coxae and femora black. Wings with radix and tegulae flavous, stigma infuscate and areolet irregularly subpetiolate. Length, 7 mm.

Differs from *A. alacer* in its apically broadly pale second and third segments, and entirely pale face; the anus is also impunctate.

It was first recorded from Britain, I know not upon what grounds, by Marshall in 1870; its author knew but a couple of ♂♂ from Silesia and Strobl is the only person who has subsequently mentioned (Ichn. Stiermarks) this species, till Pfankuch found its true position in 1906.

3. *lucidulus*, Grav.

Tryphon lucidulus, Gr. I. E. ii. 162, excl. var. 1; Ste. Ill. M. vii. 238; cf. Hal. Ann. Nat. Hist. 1839, p. 113, ♀. *Exenterus lucidulus*, Schiöd. Mag. Zool. 1839, p. 12; Ratz. Ichn. d. Forst. i. 108; ii. 112; iii. 107 et 121, ♀. *Acrotomus lucidulus*, Holmgr. Sv. Ak. Handl. 1855, p. 222; Voll. Pinac. pl. xlii, fig 1, ♂ ♀. *Delotomus lucidulus*, Thoms. O. E. ix. 884, ♀.

A slender, nitidulous, punctulate and pubescent black species. Head buccate with the mouth, face and the apically somewhat narrowed and truncate clypeus, flavous. Antennae rufescent beneath. Thorax narrower than head and immaculate with scutellum scarcely convex and apically, like a postscutellar transverse line, flavous. Abdomen black or badious, with most of the segments indistinctly flavous apically; second segment punctulate, with a short and oblique impressed line on either side of base; the following nitidulous and subglabrous. Legs rufescent, with the hind tibiae and tarsi sometimes more or less infusate; anterior coxae and trochanters flavous. Tegulae flavous; radial nervure apically slightly curved; nervellus intercepted below its centre. Length, 5—6 mm.

The colouration of this species is very variable; the face and clypeus are sometimes black with flavous markings, and the segments, excepting the first, more or less rufescent or entirely red. Pfankuch says the types differ from *A. sexcinctus* and *A. succinctus* in little but colouration, and the latter's shorter terebra; my specimen is much smoother.

This is a somewhat common species both here and abroad; Gravenhorst found it on umbelliferous flowers from June to September. On the Continent it has been bred by Hartig from *Cladius albipes* and by Graff from *Lophyrus pini* (Ratzeburg); from larvae of *Cladius difformis* and *C. albipes* (Brischke); and from *Priophorus padi* (Cameron) and *Trichio-campus rufipes* (Gaulle). Several specimens near London in August (Stephens); taken at Lynn in Norfolk by Atmore (Bridgman); Botusfleming, Cornworthy, Bishops Teignton and Grovely Wood, near Salisbury (Marshall's coll.); Bolt Head, Devon, at end of June (Bignell); Guestling in Sussex (Bloomfield); Essex (Vict. Hist.); and one male given me by Garde, from Lydford in October, 1895. Stenton took a female in his garden at Herne Hill in the middle of June, 1910.

4. *laticeps*, Grav.

Tryphon laticeps, Gr. I. E. ii. 214, ♀. *Delotomus laticeps*, Thoms. O. E. ix. 884. *Acrotomus laticeps*, Pfank. Zeits. Hym. Dip. 1906, p. 289, ♀.

A black species with the whole face, the cheeks broadly, the antennae beneath, scutellum apically and postscutellum, flavous; the abdomen centrally, with tibiae and anterior femora, rufescent; areolet irregularly triangular and subpetiolate. Length, 6—7 mm.

This female differs from the remainder of the genus in having the cheeks buccate and not dentately produced below the mandibles; from *A. lucidulus* in its subtransverse and apically a little rounded clypeus; it is similar in its abdominal and clypeal conformation to *A. mesoleptoides*, but the cheeks are simple and buccate, their flavescence extends beyond the centre of the eyes, the temples are dilated, the metathoracic areola is shorter and the stout terebra also shorter.

Its inclusion in our list is open to criticism, since it was introduced by Desvignes, in the genus *Tryphon*, in 1850 on the strength of a single ♀ *Cteniscus pachysoma*; though its range from Germany to Sweden renders its occurrence not improbable.

Tryphon cephalotes, Gr. (I. E. ii. 246; Ste. Ill. M. vii. 250; Ratz. Ichn. d. Forst. ii. 115), is also referred to the present genus and synonymised by Pfankuch (*loc. cit.*) with *A. lactus*, Grav. It was bred from *Nematus ribesii* by Rondani. We know nothing of it in Britain, however, beyond Stephens' unreliable record from near London; though Haliday seems to have recognised it, since he placed it in his genus *Cteniscus* in 1839.

5. *sexcinctus*, Grav.

Tryphon sexcinctus, Gr. I. E. ii. 164; Ste. Ill. M. vii. 238; Fonsc. Ann. Soc. Fr. 1849, p. 219. *Exenterus sexcinctus*, Schiöd. Guér. Mag. 1839, p. 12, *nota*; Holmgr. Sv. Ak. Handl. 1855, p. 229, ♀. *Cteniscus sexcinctus*, Brisch. Schr. Phys. Ges. König. 1871, p. 97; Schr. Nat. Ges. Danz. 1878, p. 104, ♀; cf. Hal. Ann. Nat. Hist. 1839, p. 113. *Acrotomus sexcinctus*, Pfank. Zeits. Hym. Dip. 1906, p. 93.

Shining, finely punctulate and black, with abdomen not red-marked. Head transverse and a little tumidous, hardly constricted posteriorly; mouth, clypeus, cheeks and large lateral facial marks, flavous; clypeus distinctly discreted and impressed before the rounded apex; frons punctulate and centrally sulcate. Antennae somewhat shorter than body, nigrescent; paler below, with scape entirely black. Thorax immaculate, notauli distinct; metathorax somewhat short with distinct areae, areola subsemicircular and petiolar area perpendicular. Scutellum apically deplanate, black with its entire apex, and the bifoveolate postscutellum lined with, flavous. Abdomen black; basal segment convex, somewhat short, gradually dilated apically, subrugulose, laterally margined, discally bicarinate to its centre, with the apical angles rounded; remaining segments shining, with their apical margins flavidous. Legs normal, red; hind tarsi and tibiae nigrescent, with the latter basally testaceous; tarsal claws distinctly pectinate. Tegulae flavidous; nervellus intercepted a little below its centre. Length, 5—7 mm.

I entertain some doubts respecting the distinction of this species from the next, since their sculpture appears almost identical; for the present, however, I have been satisfied to separate them by the facial markings, a very obvious though doubtfully reliable character.

A. sexcinctus is, perhaps, rarer than the following species both here and on the Continent, whence Gravenhorst records it in June and Van Burgst in August; Brischke as bred from larvae of *Dineura* (*Hemichroa*) *alni* and Gaulle from *Cladius difformis*. Stephens found it "rare: taken within the metropolitan district in July"; it was considered to be common at Glanvilles Wootton by Dale and in Norfolk by Bridgman; Bignell found it at Bickleigh and Horrabridge at the beginning and end of September, in Devon. It is probably local, since I have several from Dr. Capron's collection, from Shere and several taken during May, June and July, 1900, 1901 and 1902 by Charbonnier in his garden at Redland, near Bristol. Stenton takes it in profusion in his garden at Herne Hill and has found it at Wimbledon.

6. *succinctus*, Grav.

Tryphon succinctus, Gr. I. E. ii. 166, ♂; cf. i. 688; Ratz. Ichn. d. Forst. i. 128; ii. 116; Fonsc. Ann. Soc. Fr. 1849, p. 220, ♂. *T. marginellus*, Gr. I. E. ii. 167; Fonsc. Ann. Soc. Fr. 1849, p. 220; Ratz. Ichn. d. Forst. iii. 124, ♀. *Exenterus succinctus*, Holmgr. Sv. Ak. Handl. 1855, p. 230, ♀. *Cteniscus succinctus*, Brisch. Schr. Nat. Ges. Danz. 1878, p. 104, ♂ ♀; cf. Hal. Ann. Nat. Hist. 1839, p. 113 et Thoms. O. E. ix. 891. *Acrotomus succinctus*, Pfank. Zeits. Hym. Dip. 1906, p. 94.

A very finely punctate and very shining species, with the abdomen not red-marked. Head transverse, sparsely punctate and posteriorly narrowed; mouth, clypeus, cheeks and face, stramineous; clypeus slightly depressed before its rounded apex; face a little elevated and pubescent, with a black tubercle below the scrobes. Antennae somewhat shorter than body, filiform and nigrescent, becoming apically ferrugineous beneath. Thorax narrower than head, pubescent, sparsely punctate and black with margin of pronotum and small callosities before and below radices stramineous; notauli distinct, pleurae centrally smooth; meta-thoracic areae distinct, with areola pentagonal. Scutellar and post-scutellar apices stramineous, the former foveolate. Abdomen subfusiform and strongly nitidulous, black with apical margin of all the segments and whole venter stramineous; basal segment gradually dilated apically, laterally margined, with discal carinae extending beyond centre and the apex rectangular; terebra stout, black and not exerted. Legs slender, red; anterior coxae and trochanters stramineous, hind ones of ♂ subconcolorous; hind tarsi and tibiae nigrescent with base of latter often pale; tarsal claws pectinate. Wings slightly clouded; stigma infusate, tegulae stramineous. Length, 6 mm.

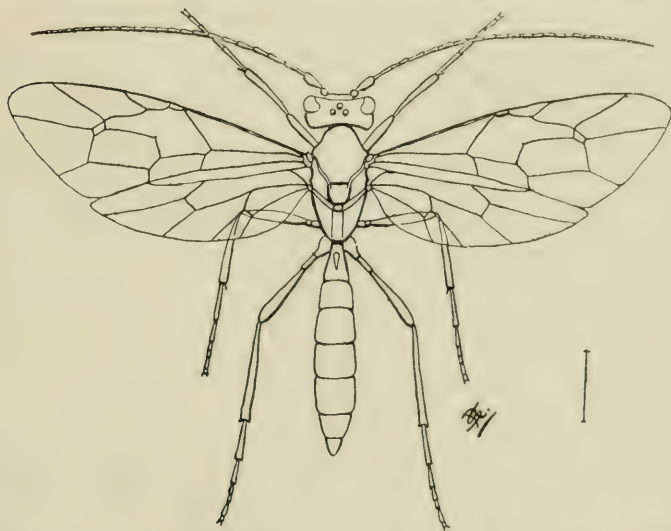
It is similar to *A. sexcinctus*, but more slender and shining with different colour. I at first thought there could be but little doubt that Brischke was correct in his supposition (*loc. cit.*) that *T. 5-cinctus*, Grav., is the male of *T. succinctus*, though Thomson did not follow him, and he himself continued to use the later name up to 1892, since which time no one has mentioned this species till Pfankuch disproved it by examining the types in 1906.

One of the commonest of the present group both here and in north-west Europe where it is found on umbelliferae in July, extending to September. Ratzeburg bred it in Germany from *Lophyrus virens* and *Athalia spinarum*, Fab. = *Colibri*, Christ; and Gaulle adds *Pristiphora geniculata*, in his French Catalogue. It appears to have been unknown to Stephens, but Marshall found it at Botusfleming in Cornwall, and Bignell at Bickleigh in Devon in the middle of August. I have seen examples taken at Lynn in Norfolk (Atmore), Felden (Piffard), Abinger Hammer in Surrey, August, 1900 (Butler), Lydford in October, 1895 (Garde), New Forest (Miss Chawner), Taunton in August (Charbonnier), Greenings in June, 1871 (W. Saunders), Shere (Capron), Aldeburgh in the middle of September, 1899 (Tuck), and have myself found it at Lyndhurst in the middle of July.

7. *mesoleptoides*, Steph.

Tryphon mesoleptoides, Ste. Ill. M. vii. 245, ♀. *Acrotomus coarctatus*, Holmgr. Sv. Ak. Handl. 1855, p. 224, ♂ ♀. *Delotomus coarctatus*, Thoms. O. E. ix. 885, ♀.

A black species with face partly flavous and abdomen centrally red. Head buccate and not posteriorly constricted; mouth and face flavous, the latter triangularly black centrally; clypeus apically subtruncate and frons coarsely punctate. Antennae red, with only the scape and basal flagellar joint discally black. Thorax punctate, hardly narrower than head and black, with a circular testaceous callosity before radices; areola and costulae traceable though weak. Scutellum and usually postscutellum flavous. Abdomen black with the very convex second and third segments, and often the fourth, red; remainder nigrescent and the apical four obsoletely white-margined; basal segment half as long again as apically broad,



hardly explanate apically, with apical angles red and petiole somewhat slender, laterally margined and discally bicarinate to near its apex; valvulae large and exserted. Legs normal and fulvescent; anterior coxae and trochanters infusate; hind legs red with coxae and trochanters, except apices of the latter, and sometimes their femora black. Wings slightly clouded, stigma conspicuous and piceous with a white basal dot, areolet petiolate and triangular; nervellus subopposite and intercepted slightly below its centre. Length, 8—10 mm.

The above structural details are drawn from the type in the National Collection, where are also ten other females from Desvignes'. It was found by Stephens near Hertford in June; and is recorded from Essex in the Vict. Hist. *A. coarctatus* has not hitherto been recorded from Britain nor synonymised with Stephens' species; but it is not rare here, and I possess it in Piffard's collection from Felden in Herts, Beaumont's collection from Chobham in Surrey, taken at the end of May, 1890, and there is another in the Edinburgh Museum.

SMICROPLECTRUS, Thomson.

Thoms. O. E. ix. 882; (?) *Microplectron*, Först. Verh. pr. Rheinl. 1868, p. 195 (nec Dahlb. 1857).

Body very finely punctate and pubescent. Face apically explanate; mandibular teeth of equal length. Flagellum stout and basally attenuate. Metathoracic areae complete, with the central determinate and not transverse. Abdomen clavate, broadly white-banded; first segment basally subauriculate, the second not transverse; ventral valvulae of ♀ vomeriform. Hind tibia with one very minute external calcar.

Campoplex costulatus, Bridg., does not belong to this genus, as indicated by Dalla Torre.

1. *jucundus*, Holmgr.

Exenterus jucundus, Holmgr. Sv. Ak. Handl. 1855, p. 227, ♂ ♀. *Smicroplectrus jucundus*, Thoms. O. E. ix. 888, ♂ ♀. *Cteniscus jucundus*, Bridg. Trans. Ent. Soc. 1889, p. 434; cf. Tosq. Ann. Soc. Belg. 1890, p. 102.

A nitidulous species, with short pubescence. Frons glabrous and obsoletely punctate; clypeus somewhat convex, and slightly impressed before the rounded apex; costulae wanting and apophyses small. Basal segment elevated and sulcate, with carinae extending beyond its centre. Nervellus intercepted slightly below its centre.

Black with the mouth, clypeus, face, underside of scape, tegulae, apex of scutellum, a pleural line, apical margins of segments in ♂ narrowly, in ♀ broadly, and the anterior trochanters with apices of coxae, flavous-white. Flagellum beneath and the anterior legs flavo-testaceous; hind legs infusate, with their femora often rufescent. Length, 5 mm.

This species strongly resembles *Exenterus Bohemani*, but differs in its smaller size, smooth frons, the more elevated and centrally sulcate basal segment, black scutellum, etc.

It is recorded from Lapland and Belgium; and Bridgman, in bringing it forward as British (*loc. cit.*) on the strength of a single ♂, captured by Champion at Aviemore, points out that the scutellum is black.

2. *quinquecinctus*, Grav.

Ichneumon quinquecinctus, Gr. Mem. Ac. Sc. Torin. 1820, p. 372, ♂. *Tryphon quinquecinctus*, Gr. I. E. ii. 165; Ste. Ill. M. vii. 239; Fonsc. Ann. Soc. Fr. 1849, p. 219, ♂. *Microplectrum quinquecinctus*, Pfank. 1906, p. 94. *Exenterus erosus*, Holmgr. Sv. Ak. Handl. 1855, p. 227; Voll. Pinac. pl. xlii, fig. 5, ♀. *Cteniscus erosus*, Brisch. Schr. Phys. Ges. König. 1871, p. 97; Schr. Nat. Ges. Danz. 1878, p. 103, ♀.

A shining, pubescent and very finely punctate species. Head transverse and not constricted posteriorly; clypeus apically rounded and depressed; frons obsoletely canaliculate. Thorax punctate, with short pubescence and distinct notauli; pleurae punctate with the speculum smooth; metathorax subrugulose with the areola concave and apophyses

small. Scutellum apically impressed. Basal abdominal segment rugulose, laterally margined and discally carinate nearly to its apex; remaining segments scabriculous and somewhat dull. Areolet shortly petiolate; apex of radial nervure nearly straight and nervellus intercepted below its centre.

Black with the clypeus, mandibles, palpi, face, cheeks, underside of scape, tegulae, scutellum, postscutellum and apical margins of all the segments, flavidous testaceous. Flagellum, base of scutellum and the legs partly red. Anterior coxae and trochanters flavous, the hind ones black. Length, 8—9 mm.

I do not know this species, of which Brischke bred the ♂ from larvae of *Nematus cheilon* on the Continent, where it is said to occur in June. It was found rarely within the metropolitan district by Stephens in July; at Wimbledon in Surrey during July, 1880, by Bridgman and at Kings Lynn in Norfolk in June, 1887, by Atmore (Trans. Ent. Soc. 1889, p. 434).

DIABORUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 195; Thoms. O. E. ix. 882.

Body very finely punctate and pubescent. Mandibular teeth of equal length; metathoracic areae complete with the central determinate and not transverse; apophyses obsolete. Abdomen subsessile, with the discal segments more broadly white-margined in the centre; first segment short and but little narrowed basally; the second obliquely impressed on either side of the base; ventral valvulae geniculately compressed and not vomeriform. Hind tibiae not calcarate; tarsal claws simple; areolet entire.

1. *lituratorius*, Linn.

Ichneumon lituratorius, Linn. F. S. 1761, 400; Gr. Nov. Act. Acad. 1818, p. 285; I. E. iii. 948. *Tryphon scalaris*, Gr. lib. cit. ii. 149; Ste. Ill. M. vii. 235, ♂. *T. scrlituratus*, Gr. I. E. ii. 159; Ste. Ill. M. vii. 237, ♀; Ratz. Ichn. d. Forst. ii. 117; iii. 127. *T. lituratorius*, Zett. I. L. 389, ♀. *Exenterus lituratorius*, Holmgr. Sv. Ak. Handl. 1855, p. 228, ♂ ♀; Voll. Pinac. pl. xlii, fig. 6. *Diaborus lituratorius*, Thoms. O. E. ix. 889, ♂ ♀.

A nitidulous and finely punctate species. Clypeus apically rounded; frons centrally canaliculate; antennae but slightly shorter than the body; metathorax short, with the petiolar area vertical. Basal segment of ♂ rugulose with distinct carinae, of ♀ more glabrous with carinae obsolete. Nervellus intercepted far below its centre.

Black with the mouth, clypeus, more or less of face, under side of scape, and lines both before and beneath tegulae, flavescent. Anterior coxae and trochanters, a triangular discal mark at apices of segments and the venter white in ♂, flavescent in ♀. Femora, tibiae and tarsi red or rufescent, with the latter sometimes infusate. Length, 5—7 mm.

The scutellum is usually apically flavous-marked, the tegulae flavous and in ♀ the sternum is also usually more or less broadly flavous and the antennae apically rufescent. Marshall places *Exenterus gibbus*, Ratz., as synonymic with this species, and I am ignorant of the grounds upon which Dalla Torre considers them distinct.

D. lituratorius is by no means an uncommon species and has been somewhat frequently bred in Germany from *Nematus laticrus*, *N. septentrionalis*, *N. ribesii*, *N. salicis* and *N. coryli* (Ratzeburg); larvae of *Dineura alni* (Vollenhoven); larvae of *Dineura rufa*, *Nematus pavidus*, *Selandria* sp. (Brischke); and from *Pristiphora conjugata* (Gaulle). In Britain it is a widely distributed garden insect, though I have never taken it myself: Rare at Coombe Wood in June, about London in July and in Shropshire (Stephens); not common at Glanvilles Wootton (Dale); several on gooseberry bushes at Lastingham in Yorks (Marshall); Earlham in Norfolk (Bridgman); taken by Parfitt at Stoke Hill, Exeter, in May (Bignell). Examples in my collection were captured at Felden in Herts (Piffard),



South Leverton in Lincs., in May, 1897 (Thornley), Painswick in Gloucester (Watkins), and several from Shere (Capron). Wilson noticed (Trans. Yorks Nat. Union, 1882, p. 107) that this species oviposited in dozens at York in 1881, upon *Nematus ribesii*, in which it lays its eggs when the host-larvae have passed their second moult. A male, correctly named by Fred Smith, in the British Museum is labelled as having been bred in England from *Eriocampa ovata*.

EXENTERUS, Hartig.

Htg. Jahresb. Fortschr. Forstw. I, P. 2, 1838, p. 270; *Cteniscus*, Hal. Ann. Nat. Hist. 1838-9, p. 113.

This genus was originally erected independently by both Hartig and Haliday in the same year for the reception of all those species of the broad genus *Tryphon* of Gravenhorst, which possessed "no terminal spines on the hind tibiae and only one on the middle tibiae." Thus it at first represented the whole *Cteniscini* and may nowadays be at once recognised from the genera more recently detached by having:—The lateral margin of basal segment simple and not sinuate, the head and thorax not closely and elongately pilose, the mandibular teeth of equal length, the hind tibiae with no minute calcar, the ventral valvulae neither cultriform nor geniculately compressed, and the second segment not impressed.

The name *Cteniscus* has been employed for a group of the present genus with the body more finely and less rugulose punctate and less coarsely pubescent, the metathoracic areae more complete with areola not transverse; but these distinctions intermingle too closely to be of generic value.

I have had considerable difficulty in deciding the priority of the two names, since the Jahresberichte is, as I have pointed out in a former volume, an extremely rare book in England (if indeed a copy exist, it is not in the British Museum), and, since Marshall made no reference to such synonymy, the genus has hitherto been known in Britain under Haliday's name, which I am prepared to sink only till such time as the exact date of Hartig's be established.

Table of Species.

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|-------|---|---------------------------------|
| (30). | 1. Areolet of the wing distinct and entire. | |
| (9). | 2. Abdomen with no red markings. | |
| (8). | 3. Scutellum more or less flavescent or rufescent. | |
| (7). | 4. Hind femora entirely immaculate red. | |
| (6). | 5. Face pale-marked; hind legs stout and apically black | 1. CURTISI, <i>Haliday</i> . |
| (5). | 6. Face black; hind legs normal and apically infusate | 2. ELEGANS, <i>Stephens</i> . |
| (4). | 7. Hind femora entirely black throughout | 3. MARGINATORIUS, <i>Fab</i> . |
| (3). | 8. Scutellum immaculate black | 4. GNATHOXANTHUS, <i>Grav</i> . |
| (2). | 9. Abdomen broadly red, at least centrally. | |
| (29). | 10. Centre of abdomen discally immaculate red. | |
| (22). | 11. Hind femora nigrescent or black. | |
| (13). | 12. Scutellum pale-marked | 5. PACHYSOMA, <i>Steph</i> . |
| (12). | 13. Scutellum immaculate black throughout. | |
| (15). | 14. Anus entirely fulvous | 6. PHAEORRHOEUS, <i>Hal</i> . |
| (14). | 15. Anus black with the segments usually pale-margined. | |
| (21). | 16. Face entirely black or white; hind femora black. | |

- (18). 17. Scape beneath and the whole face pale 7. *PICTUS*, *Grav.*
 (17). 18. Scape beneath and the whole face black.
 (20). 19. Frons closely punctate; ventral valvulae black 8. *BASALIS*, *Steph.*
 (19). 20. Frons not closely punctate; ventral valvulae pale 9. *FLAVILABRIS*, *Holmgr.*
 (16). 21. Face only marked with white; hind femora mainly red 10. *AURIFLUUS*, *Hal.*
 (11). 22. Hind femora rufescent or pale.
 (26). 23. Scutellum distinctly foveolate at its apex.
 (25). 24. Areolet sessile; scutellum and face black 11. *HOSTILIS*, *Holmgr.*
 (24). 25. Areolet petiolate; scutellum and face flavous-marked 12. *EXSTIRPATORIUS*, *Hlgr.*
 (23). 26. Scutellum simple, not apically foveolate.
 (28). 27. Face black; anus rufescent; scutellum often pale 13. *LIMBATELLUS*, *Holmgr.*
 (27). 28. Face pale; anus and scutellum black 14. *MITIGOSUS*, *Grav.*
 (10). 29. Centre of abdomen red, discally black-marked 15. *LINEOLA*, *Steph.*
 (1). 30. Areolet of the wing entirely wanting 16. *BIMACULATUS*, *Holmgr.*

1. *Curtisi*, *Hal.*

Cteniscus Curtisii, Hal. Ann. Nat. Hist. 1839, p. 113, ♀; cf. Westw. Introd. ii. 57.

Face and scutellum white-marked. Abdomen with apical margin of all the segments whitish. Legs red; hind tibiae and tarsi black and somewhat stout; tarsal claws pectinate. Length, 9 mm.

"Distinguished from *Tryphon gnathoxanthus* and allied species by its more robust figure, and the thickness of the hind tibiae and tarsi, in which respect it resembles a *Scolobates*.

"Ireland, on a willow; June" (Haliday). This appears to be a solitary ♀ (cf. Curt. B. E. fol. 399); but, in his MS. preserved in the Dublin Museum, the author says he has himself taken the present species commonly in Ireland. It is given as type of the genus *Cteniscus* by Westwood, though *C. aurifluus* is stated to be so by Curtis. Stenton rediscovered the species at Wimbledon where he took half-a-dozen examples, including both sexes during July, August and early October, 1910.

2. *elegans*, *Steph.*

Tryphon elegans, Ste. Ill. M. vii. 239, ♀.

A shining, black and flavous species, with the abdomen not red and face entirely black. Head very smooth and evenly punctate throughout, with the mouth flavous and the palpi stramineous; mandibular teeth of equal length. Antennae black, with scape piceous and flagellum rufescent beneath. Thorax very shining, black with a flavous callosity before

radices and distinct notauli; metanotum nearly smooth, pilose with costulae strong and areola elongate. Scutellum and postscutellum red; frenum narrowly whitish. Abdomen somewhat broad and very smooth, black with all the segments margined with dull white; basal segment short, broad, laterally margined, discally subglabrous and bicarinate nearly to its apex; terebra subexserted. Legs bright red; anterior tibiae internally, and trochanters, flavous; hind tibiae pale fulvous, basally whitish, with their stout apical half and tarsi black. Wings ample and hyaline; tegulae flavous; areolet triangular and petiolate; nervellus antifurcal, intercepted below its centre. Length, 7 mm. ♂ unknown.

This description is amplified from the Darenth type in the British Museum.

"Rare: taken in June at Darenth wood" (Stephens). A specimen from Barnstaple in Devon, in Marshall's collection, is correctly referred by him to this species.

3. *marginatorius*, Fab.

Ichneumon marginatorius, Fab. E. S. ii. 145; Jur. Nouv. Méth. 110, ♂; Gr. Nov. Act. Acad. 1818, p. 284. *I. amictorius*, Panz. F. G. vii. 80; Jur. Nouv. Méth. 109, ♀; Gr. Nov. Act. Acad. 1818, p. 285. *Cryptus marginatorius*, Fab. Piez. 76; Trentep. Isis, 1829, p. 864. *Bassus amictorius*, Panz. Krit. Revis. ii. 74. *Tryphon marginatorius*, Gr. I. E. ii. 191, excl. var. 2; Ste. Ill. M. vii. 242; Blanch. Hist. Nat. Ins. iii. 303. *Exenterus marginatorius*, Htg. Jahresb. 1838, p. 270; Schiöd. Guér. Mag. 1839, p. 12, *nota*; Ratz. Ichn. d. Forst. i. 107; ii. 112; iii. 121; Holmgr. Sv. Ak. Handl. 1855, p. 230, ♂ ♀; Voll. Pinac. pl. xlii, fig. 8; Thoms. O. E. ix. 887, ♂ ♀. *Cteniscus marginatorius*, Brisch. Schr. Phys. Ges. König. 1871, p. 97, ♂ ♀.

Pubescent, punctate, a little shining and black with pale-fasciated abdomen. Head tumidous, coarsely punctate and not constricted posteriorly; mouth, clypeus and a central facial mark flavous; clypeus convex and slightly depressed before its rounded apex. Antennae shorter than body, rufescent beneath with the scape apically subentire. Thorax stout and almost narrower than head with a pronotal line, two radical callosities, a line below scutellum, another below radices and usually centre of pleurae, flavous; notauli wanting; mesosternal acetabulae bidentate; metathorax short and rugose with five upper areae, of which the areola is distinct and transverse and the lateral incomplete. Scutellum flavous. Abdomen sessile and longer than thorax; two basal segments rugose and broadly fasciated with, remainder with apical margin narrowly, flavous; first segment with carinae extending beyond its centre; second obliquely impressed on either side. Legs slender; the anterior except their femora above, and hind tibiae broadly at their base, pale flavous; tarsal claws not pectinate. Wings slightly clouded; stigma infuscate, basally pale; areolet triangular; nervellus intercepted at its centre and antifurcal. Length, 7—8 mm.

This is a handsome and stout deep black species with conspicuous stramineous markings and somewhat rough sculpture, not unlike *Amotomus succinctus* superficially, but altogether more robust.

Gravenhorst took it at the end of September on *Pinus sylvestris* and tells us that Klug bred it from larvae of *Tenthredo pini* and Nees from larvae of *Pteronus pini* and *P. rufus*; Brischke bred it from the cocoons of the former, as well as from *Lophyrus frutetorum*; Gaulle records it

from *L. similis*, and it was also bred from *L. pini* by Giraud (Ann. Soc. France, 1877). As in Sweden, it is doubtless to be found in our pine woods, wherever the destructive *Lophyrus pini* occurs; it is, however, apparently very rare with us, since we have no record since Stephens called it "Very rare: taken near London and in the north of England" in 1835; but on 26th June, 1910, I received a fine specimen of this beneficial insect from Kew Gardens, just bred from *Lophyrus pini* at Staindrop in Durham.

4. *gnathoxanthus*, Grav.

Tryphon gnathoxanthus, Gr. I. E. ii. 147, ? . *Exenterus gnathoxanthus*, Holmgr. Sv. Ak. Handl. 1855, p. 231, ♂ ♀ . *Cteniscus gnathoxanthus*, Brisch. Sch. Nat. Ges. Danz. 1878, p. 105, ♂ ♀ .

A black, finely punctate and shortly pubescent species. Head transverse, shining and a little constricted posteriorly; frons deplanate and slightly impressed on either side; clypeus somewhat convex, apically rounded and, like the mouth and centrally subelevated face, flavous. Antennae somewhat shorter than the body and nigrescent with the basal flagellar joint a third longer than the second. Thorax as broad as head, convex and shining; notauli distinct, pleurae subobsoletely punctate; metathorax short with five very complete areae, of which the areola is elongate. Scutellum entirely impressed at its apex. Abdomen oblong-ovate or subfusiform; apical margin of the transverse second to fifth segments discally, and whole venter, flavidous; basal segment broad and scabrous, gradually explanate apically, with carinae extending beyond its centre. Legs slender and red with the hind tarsi and tibiae black, and base of the latter testaceous above; and anterior trochanters flavous. Wings somewhat narrow; tegulae flavous; nervellus intercepted below its centre. Length, 6—7 mm.

Distinct in its apically impressed scutellum.

The original two females of this, which was considered to be a "very distinct species" by Bridgman, were taken near Warmbrunn in Silesia by Manger; Holmgren found it not uncommonly in marshy places in Sweden; and Brischke bred a variety, erroneously thought by him to perhaps be *Tryphon melanoleucus*, Grav., from larvae of *Selandria* (*Perichista*) *pubescens* in Prussia. Bridgman twice introduced as British the only indigenous specimen he knew (Trans. Ent. Soc. 1887, p. 374 *et* 1889, p. 435), which was captured at Bickleigh Woods in Devon by Bignell on 21st August and is now in the Plymouth Museum. I possess a ♂ and ♀, taken by Col. Yerbury at The Mound in Sutherland on 24th August, 1900, and at Nairn on the Moray Firth, 21st July, 1904.

5. *pachysoma*, Steph.

Tryphon pachysoma, Steph. Ill. M. vii. 245. *T. colorator*, Zett. I. L. i. 388, ♀ *Exenterus colorator*, Holmgr. Sv. Ak. 1855, p. 234, ♀ . *Cteniscus colorator*, Brisch. Schr. Nat. Ges. Danz. 1878, p. 105, ♂; *cf. lib. cit.* 1891, p. 61.

A shining, finely punctate, black species with the abdomen centrally red and apically white. Head pubescent, tumidous, not small nor constricted posteriorly; mouth, clypeus, the buccate cheeks, two confluent facial marks and the ♂ frontal orbits narrowly, flavous; clypeus slightly impressed before the subrotundate apex. Antennae a little shorter than

the body, nigrescent, becoming rufescent apically beneath, with ♂ scape flavous beneath. Thorax stout, somewhat narrower than head, shining and finely punctate; notauli distinct; an elongate callosity before radix, sometimes apex of pronotum and in ♂ mesopleural marks, flavous; metathorax with five distinct areae, of which the areola is subhexagonal and a little longer than broad and the lateral areae transverse. Scutellum apically strongly depressed and, like the whole postscutellum, flavous; scutellar margins laterally subelevated. Abdomen fusiform or oblong-ovate, black with segments two to four transverse and bright red; apical margins of remaining segments broadly white; basal segment finely rugulose, gradually dilated apically, centrally sulcate with carinae extending beyond its centre. Legs normal; the anterior red, with coxae and base of trochanters nigrescent or in ♂ flavous; hind legs entirely infusate-black, or in ♂ with tibiae basally red. Wings hyaline, tegulae flavous, stigma infusate, areolet sub sessile and triangular; nervellus intercepted a little below its centre. Length, 7—10 mm.

The stout conformation and brilliant colours of this species render it distinct from all but *E. pictus*, of which I believe it to be a mere colour variety.

Stephens described this species from unlocalised material in Shuckard's collection and it was synonymised by Marshall with *Tryphon colorator*, the type of which was taken by Zetterstedt in Lapland during August, and examined by Holmgren; elsewhere it has only been noticed by Brischke in Prussia. There are two old specimens on bead-headed pins and one labelled "Woking, September, 1890" in Marshall's collection; and it is probably rare since no one else has found it here, though I possess three fine females, captured by Miss Ethel Chawner in the New Forest about 1895, and another, which I swept from *Linaria vulgaris* in the Bentley Woods on 22nd September, 1899.

6. phaeorrhoeus, Hal.

Cteniscus phaeorrhoeus, Hal. Ann. Nat. Hist. 1839, p. 113, ♂.

Abdomen apically fulvous. Anterior legs ferrugineous, basally black. Length, 6 mm.

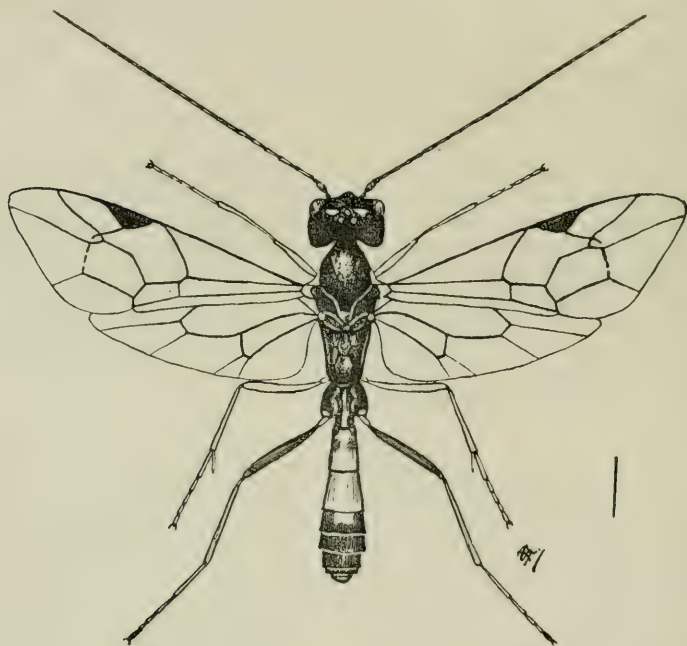
Haliday gives no locality; but, from his MS. in the Dublin Museum, it is evident that he himself took it commonly in Ireland. I know no other species of this group with the anus entirely fulvous and, consequently, here place a female taken on 18th June, 1907, at the "trap" in Mr. Adams' garden at Lyndhurst in the New Forest; it agrees perfectly with Haliday's description, given above, excepting in having the scutellar and postscutellar apices, whole mouth with centre and sides of the face, flavidous; the abdomen is pale red from apex of second segment, and the hind legs are black with only extreme base of their tibiae whitish.

7. pictus, Grav.

Tryphon pictus, Gr. I. E. ii. 288, ♀. *Exenterus similatorius*, Schiöd. Guér. Mag. 1839, p. 10, nota. *E. pictus*, Holmgr. Sv. Ak. Handl. 1855, p. 238, ♂ ♀. *Cteniscus pictus*, Brisch. Schr. Phys. Ges. König. 1871, p. 98; Schr. Nat. Ges. Danz. 1892, p. 42; Thoms. O. E. ix. 892, ♂ ♀.

A shining, punctulate and shortly pubescent, black species with centre of abdomen red. Head distinctly a little dilated posteriorly; mouth, cly-

peus and face entirely flavous; clypeus somewhat convex and slightly impressed before its rounded apex. Antennae nigrescent; scape flavidous, and flagellum testaceous, beneath. Thorax immaculate; metathorax with five upper areae, of which the areola is elongate. Scutellum black and not apically impressed. Abdomen oblong-subfusiform and black with segments two to four or five and apex of first red, sometimes black-marked; apical margin of anal segments flavidous; basal segment deplanate, laterally margined, with the discal sulcus not very distinct. Anterior legs testaceous, their coxae and trochanters flavous with the former often black above; hind legs black, with only their tibiae and tarsi testaceous. Tegulae flavous; nervellus intercepted below its centre. Length, 5—7 mm.



This species is distinct in its posteriorly dilated head, externally straight radial nervure and the nigrescent hind femora, which are sometimes ferrugineous-lined. It is very like *E. mitigosus*, but the areola is laterally not parallel and apically constricted, the anterior femora are flavo-stramineous and the hind ones black or infusate, the basal segment is longer and narrower, the face immaculate and the punctulate cheeks are more broadly marked. It appears to have been hitherto much mixed in Britain with *Tryphon cephalotes* (*Acrotomus laetus*) and identical specimens, labelled by Desvignes with the two names, are in the National Collection.

Originally found by Manger about Warmbrunn in Silesia and apparently confined to western Europe, but by no means rare with us. Found at Kings Lynn by Atmore and at Norwich (Bridgman); Bickleigh Woods in Devon, early in August (Bignell); two from Govilon, near Abergavenny

(Marshall coll.). Specimens in my collection were found by Miss Chawner in the New Forest, by Thornley at South Leverton in Notts in May 1896, by Alfred Beaumont at Whitby in Yorks in the middle of August, 1897, and several by Dr. Capron at Shere in Surrey; Dalglish took a female at Irvine Moor in Ayrshire on 30th June, 1900.

8. *basalis*, Steph.

Tryphon basalis, Ste. Ill. Mand. vii. 255, ♀. *Exenterus ustulatus*, Holmgr. Sv. Ak. Handl. 1855, p. 236, ♂ ♀. *Cteniscus ustulatus*, Thoms. O. E. ix. 891.

A shining, punctulate, black species with broadly red abdomen. Head coarsely punctate and posteriorly subdilated; mouth and clypeus flavidous, the latter convex and slightly depressed before its apex. Antennae apically ferrugineous beneath. Thorax stout and black, pleurae very finely punctulate; metathorax somewhat short with five areae, of which the areola is subhexagonal. Scutellum black. Abdomen with segments two to five nearly entirely red; anal segments black, apically whitish; basal segment subscabriculous, centrally sulcate, with carinae extending beyond its centre. Anterior legs red, with coxae and trochanters partly black; hind legs black, usually with their tibiae and tarsi infusate-ferrugineous, and rarely femora red. Tegulae flavidous; nervellus intercepted a little below its centre. Length, 7 mm.

Thomson says it may be known by the entirely black flagellum, closely punctate frons and black ventral valvulae. It is very like *E. flavilabris*, but a little stouter and of more decided red colouration. I have examined the three female specimens described by Stephens, which are now in the British Museum, with two males also from his collection; the synonymy is beyond question. Two more examples of this species were named *Tryphon proditor*, Grav., by Desvignes; this Gravenhorstian species was incorrectly placed in *Erromenus* by Marshall in 1872 (its claws are not pectinate), since it is a true *Tryphon* of the subgenus *Negales*, Först., instantly known by two apical clypeal teeth; Stephens recorded it as British on two examples, still in his collection, which have no clypeal teeth and in no way agree with Pfankuch's description of the type (Zeits. Hym.-Dip. 1907, p. 147).

The present species is hardly known outside Sweden, though probably far more widely distributed and certainly not very rare in Britain, where Bignell took it at Bickleigh in Devon on 4th September, and there is an old specimen on a bead-headed pin with no data in Marshall's collection. I have occasionally swept it in very boggy places at Chippenham in the Cambridgeshire Fens on 15th June and at Barnby in the Suffolk Broads on 18th May; Rev. F. W. Johnson has given me a male taken at Poyntzpass, Co. Armagh, in 1908; and Elliott found it at Banchory in the Scots Highlands in September, 1910. The type was found near London in June.

9. *flavilabris*, Holmgr.

Exenterus flavilabris, Holmgr. Sv. Ak. Handl. 1855, p. 237, ♂ ♀.

A black, shining and punctulate species. Mouth and clypeus flavidous, the latter slightly impressed before its rounded apex; frons convex, and face centrally subelevated and finely punctate. Basal flagellar joint a

third longer than the second. Metathoracic areae complete and distinct, with the areola elongate and subhexagonal; pleurae hardly punctulate. Abdomen with the second to fourth segments red, in ♂ sometimes dark-marked; basal segment gradually explanate apically, with the discal carinae extending beyond its centre and spiracles somewhat prominent. Hind legs black with the tibiae, except apically, red; anterior legs red with the trochanters flavidous and coxae black. Nervellus intercepted below its centre. Length, 5 mm.

A small and somewhat featureless, slender and shining species; the often dark-marked ♂ abdomen renders it liable to be mistaken for *E. Dahlbomi*, though the marks are not somewhat regularly triangular, as in the latter species.

The first British record is from the Isle of Man, where Francis Walker found it in 1869 (Marshall, Entom. 1872-3, p. 432); and there are said to be examples from Govilon near Abergavenny and Cornworthy in Devon in the latter's collection. I have recorded the species from Kerry in Ireland (Irish Nat. 1903, p. 68); Dalglish has kindly sent it to me from Cambuslang in Lanark, captured on 20th June, 1899, and Elliott found females at Banchory in the Scots highlands in September.

10. *aurifluus*, Hal.

Cteniscus aurifluus, Hal. Ann. Nat. Hist. 1839, p. 113, ♂ ♀.

Face white-marked. Abdomen red with its base and apex black, and the anal segments apically whitish. Legs red; hind ones with femora, tibiae and tarsi apically black. Length, 8 mm.

The only specimen, which has done duty for forty years, under this name in the National collection, was *Acrotomus lucidulus*.

"On Willows, Ireland; May to September" (Haliday, who says in his MS., now preserved in the Dublin Museum, that he took it himself commonly in Ireland). I possess two fine specimens of this species, which has nowhere been since noticed, though very distinct in the narrow deep black apices of the hind femora and tibiae; they were captured, also in Ireland, at Enniscorthy in Wexford on 6th September, 1898, by the late Alfred Beaumont and by sweeping reeds at Carramore Lake, Loughborough, Co. Mayo, 18th July, 1910, by myself. This Irish species occurred to me in the Suffolk marshes at Brandon on 7th June, 1910.

11. *hostilis*, Holmgr.

Exenterus hostilis, Holmgr. Sv. Ak. Handl. 1855, p. 239, ♂.

A shining, black and red-marked species. Head transverse, punctulate, shining and not constricted posteriorly; clypeus and mouth flavous, with the former subconvex and at its extreme apex depressed and rounded. Thorax gibbulous and immaculate; mesopleurae obsoletely punctulate above; metathorax with five areae, of which the areola is somewhat short and subhexagonal. Scutellum subelevated, apically deplanate. Abdomen with the second to fourth segments red, rarely black-marked; basal segment subaciculately rugose, gradually dilated apically, with parallel carinae extending beyond its centre; anus with pale pubescence. Legs

slender and red; trochanters and anterior coxae flavidous; hind coxae and sometimes their tarsi nigrescent. Wings slightly clouded; areolet subsessile, nervellus intercepted below its centre. Length, 6—7 mm.

Introduced as British by Bridgman (Trans. Ent. Soc. 1882, p. 160) and found by him at Brundall in Norfolk and near Norwich, at the end of May and in early June; also at Lakenham in the same county. Holmgren says it occurs at the end of July, and I have taken the male on 15th of that month at Louisburgh, Co. Mayo, Ireland, in 1910. This extends its western range, since it has hitherto been known only from Sweden.

12. *exstirpatorius*, Holmgr.

Exenterus exstirpatorius, Holmgr. Sv. Ak. Handl. 1855, p. 238, ♂ (*nec* Grav.).
Cteniscus lineiger, Thoms. O. E. ix. 894, ♂.

A shining, punctulate, black species with the mouth, clypeus, cheeks and face pale flavous; clypeus slightly impressed before its rounded apex. Antennae filiform, shorter than body, and ferrugineous beneath with the scape paler. Thorax gibbous and nitidulous, with margin of mesonotum and preradial lines flavidous; metanotum with five complete areae, of which the areola is subrotund. Scutellum deplanate with its apex foveate and, like the postscutellum, flavous. Abdomen centrally more or less broadly rufescent; basal segment not elevated, finely rugose and gradually a little dilated towards its apex, with carinae extending to the centre. Anterior legs pale red; hind ones fulvous with the apices of their femora, of their tibiae and tarsi nigrescent; all coxae and trochanters mainly flavous. Tegulae flavous; nervellus intercepted a little below its centre. Length, 7 mm. ♀ unknown.

This insect is similar to *E. mitigosus*, but differently marked with flavous, etc.; it was renamed by Thomson, as the species described by Holmgren was different from the *Monoblastus* of Gravenhorst, which was not extracted from this genus till 1906, when Pfankuch examined the type. The name may be allowed to stand in both genera.

I do not know this species, which is only recorded from Sweden. Marshall introduced it, I know not upon what grounds, in 1870; and we may consider it indigenous, since Bignell tells us (Trans. Devon. Assoc. 1898) that he captured it on 31st July, near the Plymouth cemetery in Devonshire.

13. *limbatellus*, Holmgr.

Exenterus limbatellus, Holmgr. Sv. Ak. Handl. 1855, p. 241, ♂ ♀. *Cteniscus limbatellus*, Brisch. Phys. Ges. König. 1871, p. 99; Schr. Nat. Ges. Danz. 1878, p. 106; *lib. cit.* 1891, p. 62, ♀.

A finely punctate, nitidulous, black species with the abdomen mainly red. Mouth and clypeus stramineous, the latter subelevated and slightly depressed before its rounded apex. Antennae testaceous beneath. Mesopleurae very finely punctate with speculum smooth; metathorax short, with the upper areae distinct and areola elongate. Abdomen mainly red; basal segment black, gradually dilated apically with carinae and central sulcus not strong; second segment black-marked; apical segments flavous-margined; venter stramineous. Legs testaceous; anterior coxae and trochanters flavous; hind coxae basally black. Tegulae flavous; nervellus intercepted below its centre. Length, 5 mm.

It is closely allied to *E. mitigosus*, but with the face black, extreme apex of scutellum usually testaceous, abdomen nearly entirely red with lateral margins sometimes narrowly infusate and the apical margins of the anal segments broadly pale.

An abundant species with us though not introduced till 1889 (Tr. Ent. Soc. p. 434) and even then doubtfully, since Bridgman's pair from Eaton and Brundall in May and June had the hind coxae almost entirely, the intermediate basally and the anus entirely, black. Later (Trans. Norf. Soc. v, p. 627) the doubt is no longer apparent. Cornworthy in Devon (Marshall coll.); Felden in Herts. (Piffard); Tostock in Suffolk, early in June, 1900 (Tuck). I have always taken it by sweeping, usually in moist situations, in Tuddenham Fen late in May, in Herringswell Fen early in June, and at Monks' Soham towards the end of August.

14. *mitigosus*, Grav.

Tryphon mitigosus, Gr. I. E. ii. 258, ♀; cf. i. Suppl. 689; Ste. Ill. M. vii. 254, ♀. *Exenterus limbatus*, Holmgr. Sv. Ak. Handl. 1854, p. 72; 1855, p. 241; 1856, p. 389, ♂ ♀. *Cteniscus limbatus*, Brisch. Schr. Phys. Ges. König. 1871, p. 98, ♂ ♀. *Tryphon flavomaculatus*, Ste. Ill. M. vii. 253 (part.).

A shining, punctulate, shortly pubescent, black species with the abdomen broadly red. Head shining, broader than thorax but not dilated posteriorly; mouth, clypeus and the transverse face flavidous, the last black-marked below scrobes; clypeus convex and slightly impressed before its rounded apex. Antennae somewhat shorter than body, nigrescent and beneath rufescent with the basal joints flavidous. Thorax immaculate with five upper metathoracic areae, of which the areola is elongate. Abdomen subclavate and black with the parallel-sided second to fourth or fifth segments mainly red and apical margins of the anal segments flavidous; basal segment margined, gradually dilated apically, twice longer than broad, with prominent spiracles and the discal sulcus distinct. Legs slender and pale red; trochanters and anterior coxae flavidous; ♂ with hind femora rarely infusate. Wings with tegulae flavidous, areolet petiolate and nervellus intercepted below its centre. Length, 6—7 mm.

This species is very like *E. pictus*, but with the head not dilated posteriorly, the radial nervure not quite straight and the hind femora nearly always entirely red.

Holmgren's *E. limbatus* was for long thought to be synonymous only with the second variety of Gravenhorst's species; but Pfankuch found that to be no more than a form of the type, and *T. flavomaculatus* with white face to be its male, erroneously termed female by its author. It is probably the latter, therefore, which Stephens "found at Darenth Wood in July," while his very different *T. subfasciatus* appeared hardly distinct to Marshall and was also taken near London, in June. Gravenhorst received the typical form from Hope, who took it at Netley in Shropshire. In ignorance of this synonymy, Bridgman introduced the species as new to Britain (Trans. Ent. Soc. 1889, p. 435) on the strength of a pair taken by him at Brundall in Norfolk at the end of June and in Cambs. early in August; and tells us that he bred *T. mitigosus*, which he nevertheless

leaves in Tryphon, from sawfly larva taken off ash at Earlham, near Norwich. It is said to prey upon *Pteronus ribesii* by Thomson on the Continent, where Holmgren took it in June and July, and it ranges from Lapland to France.

15. *lineola*, Steph.

Tryphon lineola, Ste. Ill. M. vii. 255, ♀. *Exenterus Dahlbomi*, Holmgr. Sv. Ak. Handl. 8855, p. 242, ♀.

A very finely punctate species, with the central segments triangularly red. Head transverse and a little tumidous with the mouth, clypeus, face and cheeks, flavidous; clypeus subconvex and slightly depressed before its rounded apex. Antennae red beneath. Thorax somewhat stout and shortly pubescent; prothorax with a marginal flavous mark; metathoracic areae complete with the areola elongate. Abdomen ovate-fusiform with the apical margin of all the segments flavidous and a large triangular mark on each of the second to fifth segments; the basal gradually dilated apically, with fine and parallel carinae. Legs slender and red; anterior coxae and trochanters flavous, hind coxae basally and their tarsi apically infusate. Tegulae flavidous, stigma infusate and basally paler; nervellus intercepted a little below its centre. Length, 5 mm. ♂ ♀.

The peculiar abdominal markings render it sufficiently distinct. I have examined the single exponent of Stephens' species in the National Collection and am sure of the synonymy. *E. funebris*, Holmgr., may not be distinct; at least, I consider an example from Nunton, so named by Marshall, to belong here.

Only known elsewhere from Sweden, where it was captured by Boheman and is said to be very rare. Holmgren's species was introduced as new to our fauna by Bridgman (Trans. Ent. Soc. 1883, p. 169), who took it at Horning Ferry in the Norfolk Broads at the end of June and adds that Bignell also captured a ♀ near Plymouth. I swept a single ♀ in marshes at Barton Mills in north-west Suffolk on 11th June, 1900; and Elliott has sent me males both from the Scots highlands, taken in September, and from Llandrindod in Radnor, during the middle of June, 1906.

16. *bimaculatus*, Holmgr.

Exenterus bimaculatus, Holmgr. Sv. Ak. Handl. 1854, p. 72, ♂; *lib. cit.* 1855, p. 245, ♂ ♀. *Cteniscus bimaculatus*, Brisch. Schr. Ges. König. 1871, p. 99, ♂; Schr. Nat. Ges. Danz. 1878, p. 106, ♂.

A stout, shining and very finely punctulate species. Head transverse and not narrowed posteriorly; clypeus somewhat convex, slightly depressed before the rounded apex. Antennae somewhat shorter than the body. Thorax gibbulous, scarcely longer than high, convex and as broad as the head; pleurae very finely punctate; areola subpentagonal and scutellum apically depressed. Basal abdominal segment finely rugulose and gradually dilated towards its apex. Legs slender. Areolet wanting; radial nervure apically straight and nervellus intercepted below its centre.

Black with the clypeus, mandibles, palpi, two subtriangular facial marks and the tegulae, flavous. Basal segment with a central apical red mark, the four following more or less entirely red and the remainder narrowly

flavescent apically. Legs red with the anterior coxae and trochanters flavous; hind coxae and marks on their trochanters black. Length, 4—5 mm.

Not noticed in Britain till 1881 (Trans. Ent. Soc. 1882, p. 160), though one of our commonest marsh species. Both sexes at Brundall, near Norwich, in autumn (Bridgman); Bickleigh on 30th August (Bignell); Nunton in Wilts (Marshall coll.). I have swept it in the most boggy places at Barton Mills in the middle of June, and towards the end of September in both Tuddenham Fen, and Pakenham Fen, in Suffolk.

TRICAMPTUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 194; Thoms. O. E. ix. 886.

This genus is unmistakable in the very curious sinuation of the basal segment and the strong infumescence of the anterior half only of the front wings.

1. *apiarius*, Grav.

Tryphon apiarius, Gr. I. E. ii. 196; Ste. Ill. M. vii. 242, ♂ ♀. *Exenterus apiarius*, Schiöd. Guér. Mag. Zool. 1839, p. 12, *nota*; Holmgr. Sv. Ak. Handl. 1855, p. 228; Voll. Pinac. pl. xlii, fig. 7, ♂ ♀. *Cteniscus apiarius*, Brisch. Schr. Nat. Ges. Danz. 1878, p. 104, ♀. *Tricamptus apiarius*, Thoms. O. E. ix. 886, ♂ ♀.

Head with the mouth, internal orbits and a large facial mark flavous. Antennae nigrescent, the three basal joints black and the following ferrugineous beneath. Thorax immaculate black with very distinct



metanotal areae. Scutellum at least apically, and postscutellum, flavous. Abdomen with all the segments flavous-margined, the first occasionally immaculate or only apically flavous dotted. Legs normal, the anterior flavous beneath, with trochanters entirely infusate and the tibiae externally, especially towards their apices, fuscous; hind legs with the tibiae

flavous, externally infusate and apically black. Wings slightly clouded with the anterior margin very strongly infumate; stigma, radix and tegulae infusate, rarely with the stigma red and radix ferrugineous; areolet irregular and subpetiolate. Length, 10 mm.

It occurs throughout northern and central Europe, but with us is quite certainly rare. Bawsey Heath, Lynn by Atmore in Norfolk (Bridgman); Essex (Vict. Hist.). I have seen a specimen captured at Woking on 24th June, 1903, by Rev. F. D. Morice; and possess others taken at Guestling in Sussex in 1880 by Rev. E. N. Bloomfield and Lynton, Devon, in 1890, by Edwards.

SUB-TRIBE

MESOLEPTINI.

Among the present Subfamily of Tryphoninae, this sub-tribe is at once recognised by the possession of distinct calcaria and the strongly petiolate abdomen; but so closely do both sexes resemble certain Ichneumoninae in the latter feature and their smooth bodies that the older authors not only sometimes mixed them, but Gravenhorst actually placed *Mesoleptus* (with *Sphinctus*) next to them, as being on account of the distinct petiole most closely allied. Several species of *Acrotomus*, among the *Cteniscini*, are only to be separated by their lack of hind calcaria. For the sake of convenience I have endeavoured to place our species in as few genera as is consistent with natural grouping, and find it necessary to add but one to those contained in our last catalogue.

Table of Genera.

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| (10). 1. Vertex of head very distinctly transverse; petiolar spiracles central. | |
| (3). 2. Basal segment straight, linear and not apically dilated | MESOLEPTUS, <i>Grav.</i> |
| (2). 3. Basal segment curved and distinctly dilated apically. | |
| (5). 4. Petiole stout; nervellus elongately postfurcal | PERISPUDUS, <i>Thoms.</i> |
| (4). 5. Petiole slender; nervellus opposite or not elongately postfurcal. | |
| (7). 6. Lower mandibular tooth the longer; terebra reflexed | CATOGLYPTUS, <i>Holmgr.</i> |
| (6). 7. Mandibular teeth of equal length; terebra not reflexed. | |
| (9). 8. Clypeus not truncate; second segment not impressed | EURYPROCTUS, <i>Holmgr.</i> |
| (8). 9. Clypeus apically truncate; second segment basally impressed | NOTOPYGUS, <i>Holmgr.</i> |
| (1). 10. Vertex of head buccate and subquadrate; petiolar spiracles before centre. | |
| (12). 11. Mandibular teeth of unequal length; areolet entire | PERILISSUS, <i>Holmgr.</i> |
| (11). 12. Mandibular teeth of equal length; areolet wanting | ECLYTUS, <i>Holmgr.</i> |

MESOLEPTUS, *Gravenhorst.*

Gr. I. E. ii. (1829), 3; Holmgr. Sv. Ak. Handl. 1855, p. 100.

Head transverse and not buccate, vertex subemarginate; mandibles bidentate, with the lower tooth often the longer; clypeus subdiscreted, not convex, often apically depressed; face not prominent, nearly always flavous-marked. Antennae filiform, very slender and never shorter than body; basal flagellar joint longer than second, scape ovate. Notauli generally distinct and mesonotal disc often deplanate; metathorax evenly rounded and at most longitudinally bicarinate centrally; spiracles circular. Scutellum normal, subconvex. Abdomen distinctly petiolate and always more or less broadly red; basal segment sublinear, strongly elongate and subparallel-sided throughout, with spiracles at or near its centre; anus of ♀ often compressed. Legs slender and elongate; hind tibiae bicalcarate, tarsal claws somewhat large and not pectinate. Wings ample and somewhat broad; areolet usually entire; nervellus variable.

This differs from all other Tryphonid genera in the structure of its basal segment, straight and not curved disco-ventrally, slender, narrow, very slightly explanate towards its apex and always parallel-sided to the spiracles, with the apical margin at most one-third as broad as its total length. Consequently I use this genus in the broader sense as set forth by Holmgren in 1855; Förster's names form natural enough groups, but in a section of such irregular neurulation as the present the absence of areolet, position of nervellus, etc., are not generic features and, if this were so, their adoption would unnecessarily complicate the classification of our "limited fauna."

Very little progress could be made in the synonymy or further knowledge of the last twenty-eight British species of this genus, placed alphabetically by Marshall in his 1872 Catalogue, because not referred to by Holmgren, until the Gravenhorstian types were competently revised. This has very recently been done by Pfankuch (Zeits. Hym.-Dip. 1906-7) with the result that, so far from belonging to this genus, almost the majority are not Tryphoninae at all. Of *M. albolineatus*, Grav. (I. E. i, Suppl. 691) describes a single individual of uncertain sex, found by Hope near Netley, which he thought possibly a form of *M. quadriannulatus*; Stephens adds (Illus. vii. 215) that it occurs near London in June; and Desv. (Cat. 32) regards it as a form of *Coelichneumon moestus*, Gr.; but Pfankuch tells us the type is lost, and the species is not now represented in Stephens' collection. *M. antilope* will be found under *Cataglyptus*. Grav. compares (I. E. i, Suppl. 683) his *M. arridens* with *M. xanthostigma* and records an individual of ambiguous sex from Hope at Netley; Stephens (Illus. vii. 221) "Found it near London in June," and there are two *Euryprocti* under this name in his collection. *Mesatractodes properator*, Hal. (Ichn. Brit. ii. 257) is a synonym of *M. (Callidiotes) luridator*, Grav., placed under *Euryproctus* by Marshall in 1872, which = both the *M. coxator* and the *M. ventrator*, erroneously given as a form of *M. delusor* in the 1872 Catalogue. The typical form of *M. delusor* is a *Cataglyptus*. *M. decipiens*, Gr. (I. E. ii. 16 et ii. 848) is nothing but the ♀ of *Dicaelotus decipiens*. *M. evanialis*, Gr. (I. E. ii. 16 et Ste. Illus. vii. 213) from Darenth Wood in June, is a Campoplegid, *Dimophora cognata*, Brisch.; and that *M. infernalis*, Grav. et Steph., belongs to the same Ophionid group is evidenced by the six *Lathroplex* in the latter's collection, "found

near London in June, not common." *M. exornatus*, Gr. is an *Eclytus*; and I believe *M. gracilipes*, Curt., to belong to *Mesoleius*, sensu lato. *M. lactus*, Gr. = *Acrotomus orbitatorius*, Holmgr. *M. leucostomus*, Gr., said to have been found rarely about London, was thought by Brischke (Trans. Ent. Soc. 1882, p. 155) to be a *Trematopygus*, but both the type and Stephens' examples are lost. *M. narrator*, Gr., is *Notopygus analis*, Holmgr.; and *M. pectoralis* is a *Mesoleius*. *M. quadriannulatus* I have already treated of (Ichn. Brit. i. 167); and *M. spheginus* is a *Panargyroptus*. I cannot place Curtis' inadequately described *M. speciosus*, with its pale scutellum, red abdomen with the basal segment alone black and wanting areolet. The type of *M. subcompressus* is lost and its name better forgotten; *M. undecimnotatus*, Desv., is nothing but a ♂ *M. cingulator*, Grav., of which *M. submarginatus*, Steph., is a typical female; and the type of the latter's *M. thoracicus* appears lost, since I cannot find it in the British Museum. What is *Mesoleptus flavopictus*, Gr. (I. E. ii. 33, ♂), the type of which Pfankuch says is lost? Brischke placed it in *Mesoleius*, next to *M. comptus*, Hlgr., in 1871; Marshall placed it in *Perilissus* in his 1872 Catalogue, and in 1870 synonymised it with *M. trimaculatus*, Steph. (Ill. M. vii. 217, ♀), the type of which is now lost. But in Mus. Brit. is a ♀, doubtless that *M. flavopictus* recorded by Stephens (*l.c.*) from Darenth Wood, agreeing perfectly with Gravenhorst's description and to some extent with that of Thomson's Cohors 2 of *Mesoleius* (O. E. 2043), for the face is pale but the areolet is entire with both scutelli pale. Bridgman does not simplify the matter at Trans. Ent. Soc. 1887, p. 373.

Table of Species.

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| (32). | 1. Thorax with prosternum and radical dots not or not alone pale. | |
| (27). | 2. Cheeks distinctly sculptured, alutaceous, punctate or rugose. | |
| (24). | 3. Front wings with areolet entire and complete. | |
| (19). | 4. Petiolar spiracles not before centre; postpetiole parallel [HADRODACTYLUS, Först.]. | |
| (14). | 5. Nervellus opposite and intercepted at its centre. | |
| (13). | 6. Metanotal and petiolar carinae obsolete or wanting. | |
| (8). | 7. Postpetiole slightly explanate, acutely margined | 1. INDEFESSUS, Grav. |
| (7). | 8. Postpetiole not apically explanate, nor acutely margined. | |
| (10). | 9. Three basal segments dull and rugulose | 2. BIPUNCTATUS, Grav. |
| (9). | 10. Three basal segments, or second and third, subglabrous. | |
| (12). | 11. Petiolar and metanotal carinae present | 3. PALUDICOLA, Holmgr. |
| (11). | 12. Petiolar and metanotal carinae wanting | 4. TYPHAE, Fourc. |
| (6). | 13. Metanotal and petiolar carinae very strong and stout | 5. VILLOSULUS, Thoms. |
| (5). | 14. Nervellus antefurcal and intercepted below its centre. | |

- (16). 15. Notauli wanting; metathorax subglabrous 6. FUGAX, *Grav.*
 (15). 16. Notauli distinct; metathorax rugulose.
 (18). 17. Fenestrae discreted by a line; antennae stouter 7. XANTHOSTIGMA, *Grav.*
 (17). 18. Fenestrae discreted by a dot; antennae more slender 8. VULNERATUS, *Zett.*
 (4). 19. Petiolar spiracles before centre; postpetiole subexplanate [ALEXETER, Först.].
 (21). 20. Body entirely testaceous, hind femora concolorous 9. TESTACEUS, *Fab.*
 (20). 21. Body mainly black, hind femora often concolorous.
 (23). 22. Nervellus intercepted below centre; hind femora black 10. RUFICORNIS, *Grav.*
 (22). 23. Nervellus intercepted in centre; hind femora red 11. ATTENUATUS, *Bridg.*
 (3). 24. Front wings with no trace of areolet [MESOLEPTUS, Först.].
 (26). 25. Abdomen black with incisures flavescent 12. CINGULATUS, *Grav.*
 (25). 26. Abdomen broadly red in the centre 13. PROSOLEUCUS, *Grav.*
 (2). 27. Cheeks subglabrous, with extremely obsolete sculpture.
 (29). 28. Areolet wanting; legs slender; scutellum black [PHOBETES, Först.]. 14. LEPTOCERUS, *Grav*
 (28). 29. Areolet entire; legs stout; scutellum pale [GAUSOCENTRUS, Först.].
 (31). 30. Face and femora pale; stigma testaceous 15. MACRODACTYLUS, *Hlgr.*
 (30). 31. Face and hind femora black; stigma nigrescent 16. SORDIDUS, *Grav*
 (1). 32. Thorax with prosternum and radical dots alone pale 17. GLACIALIS, *Woldst.*

1. indefessus, *Grav.*

Ichneumon indefessus, Gr. Mem. Ac. Sc. Torin. 1820, p. 364, ♀. *Mesoleptus typhac*, var. 2, Gr. I. E. ii. 64, ♀. *M. indefessus*, Ste. Ill. M. vii. 222, ♀. *M. femoralis*, Holmgr. Sv. Ak. Handl. 1855, p. 105; Brisch. Schr. Nat. Ges. Danz. 1878, p. 68, ♂ ♀. *Hadrodactylus femoralis*, Thoms. O. E. ix. 920 et xix. 1979, ♂ ♀.

A finely punctulate black species, with black hind femora. Head not constricted posteriorly; mouth, clypeus and face, flavous; clypeus deplanate, punctulate and apically subtruncate. Scape flavous, and flagellum red, at least beneath. Thorax as broad as head; metathorax subrugulose, with indeterminate discal areae. Abdomen black, with usually the second to fourth segments red; basal segment narrow but not slender, elongately sulcate discally, with postpetiole acutely margined laterally. Legs red with all the coxae, hind femora and apices of their tibiae broadly nigrescent, their trochanters usually flavescent; hind tarsi always infusate; all femora somewhat stout; anterior coxae sometimes pale and hind tibiae rarely mainly nigrescent. Tegulae flavous, stigma infusate and somewhat narrow; areolet petiolate; nervellus subopposite and intercepted nearly in its centre. Length, 11 mm.

Similar to *M. vulnerator*, but stouter with antennae shorter, nervellus intercepted higher and coxae black; like *M. paludicola*, but with hind femora always black and claws longer; but known by the structure of the basal segment, narrow and dark stigma, and black hind femora.

It ranges through Germany, Italy, Sweden, Belgium and France, occurring in May and June. Apparently rare with us and probably mixed with *M. typhae*, from which the black stigma and hind femora instantly distinguish it; but found near London in June and July by Stephens; as well as at Ivybridge in Devon in the middle of August, says Bignell. I swept a single pair (not *in cop.*) near the Knight Wood Oak in the New Forest on 14th June, 1907, of which the male has the abdomen but obscurely rufescent centrally while the second to fourth segments of the female are clear red.

2. *bipunctatus*, Grav.

Mesoleptus bipunctatus, Gr. I. E. ii. 54; Ste. Ill. M. vii. 220, ♂. *M. marginatus*, Bridg. Trans. Ent. Soc. 1886, p. 356, ♂. *Hadrodactylus bipunctatus*, Pfank. Zeits. Hym.-Dip. 1906, p. 24, ♂. (?) *Perilissus bipunctatus*, Brisch. Schr. Phys. Ges. König. 1871, p. 70, ♀; Schr. Nat. Ges. Danz. 1878, p. 72, ♂ ♀.

Head posteriorly subexplanate; face black with the inner orbits, clypeus and mouth flavous; cheeks not short, frons rugose but slightly shining. Scape flavous, and flagellum testaceous, beneath. Mesonotum shining and punctate, with distinct notauli; mesopleurae shining, more rugulose punctate below, with epinemia entire; metathorax dull and rugose, with obsolete carinae. Abdomen black with third segment, except two discal spots, and fourth partly red; three basal segments rugosely punctate and dull, remainder nitidulous; basal segment subconstricted before the prominent spiracles. Anterior legs testaceous, with their black-marked coxae and trochanters flavous; hind legs red with coxae and trochanters black, apically flavous, their tarsi and apices of both femora and tibiae nigrescent. Stigma narrow and piceous; radix and tegulae flavous; areolet entire, petiolate and suborbicular; radius apically sinuate; nervellus opposite and intercepted hardly below its centre. Length, 11 mm. ♂ only.

Pfankuch says this species may be known by the broad head, facial colouration and basally dull abdomen; he does not mention the pale dots beneath nor before radices. I expect Brischke's species was entirely distinct.

Gravenhorst's two males came from Hungary and Germany; Gaulle records it from France, Stephens says it was "found, but rarely, near London, in June"; and I possess a single example, kindly given me by Mr. F. C. Adams, who took it in his fly-trap at Lyndhurst in the middle of July, 1907. Bridgman took his insect at Brundall, near Norwich, in May, 1881; I think that the peculiar facial markings, position of the nervellus, etc., show it can be nothing but a somewhat dark form of the present species with the abdomen centrally and hind femora infuscate; Dalla Torre says it has been bred by Fletcher from *Eriocampa varipes*, but I can find no confirmation of this in literature, though Ratzeburg raised it from *Nematus ribesii* (Ichn. d. Forst. iii. 122) and considered the pedal colouration variable.

3. *paludicola*, Holmgr.

Mesoleptus typhae, var. 5, Gr. I. E. ii. 66, ♀ (*sic* ♂). *M. paludicola*, Holmgr. Sv. Ak. Handl. 1854, p. 68; l. c. 1855, p. 105; Brisch. Schr. Nat. Ges. Danz. 1878, p. 67, ♂ ♀. *Hadrodactylus paludicola*, Thoms. O. E. ix. 920 et xix. 1978, ♂ ♀. (?) *Mesoleptus gracilis*, Ste. Ill. M. vii. 228, ♀.

A slender black species with the legs entirely, and abdomen mainly, red. Head hardly constricted posteriorly with clypeus and face flavous, latter often centrally black; frons finely rugose-punctate; clypeus a little convex and very remotely punctate, subdiscreted; lower mandibular tooth hardly the longer, cheeks not very short. Scape flavous, and flagellum red, at least beneath. Thorax almost narrower than head, with pleurae subaciculately punctate and speculum smooth; basal area and areola distinct, but both apically incomplete. Abdomen slender, centrally very broadly clear red; basal segment narrow and strongly bicarinate, with spiracles beyond its centre; second and third elongate; anus of ♀ compressed and white-pilose. Legs slender and red with apices of hind femora and tibiae sometimes, and their coxae rarely, infusate; anterior coxae and trochanters of ♂ stramineous. Stigma infusate testaceous; nervellus intercepted at or slightly below its centre. Length, 8—11 mm.

It is known by the bicarinate petiole, metanotal areae and slender form. The legs are of variable colour, entirely fulvous in the typical form, but often basally infusate, and Brischke says the hind femora are occasionally black.

Not infrequent in marshy situations from Sweden to France. Marshall possessed a single specimen from Botusfleming in Cornwall; Marquand took it at Lands End; and Bignell captured it in early June, at Bickleigh in Devon. A single female occurred to me by sweeping reeds on a windy day at Oulton Broad in Suffolk on 5th August, 1898, but I have not since met with it during several visits to the same spot. Stephens took his typical *M. gracilis* at Hertford in June; I have examined the unique female in Mus. Brit. and am inclined to consider it a small form of the present species, but with the abdomen more finely sculptured, the stigma flavous and flagellum entirely fulvous; I find no mention of this insect in Marshall's Catalogues.

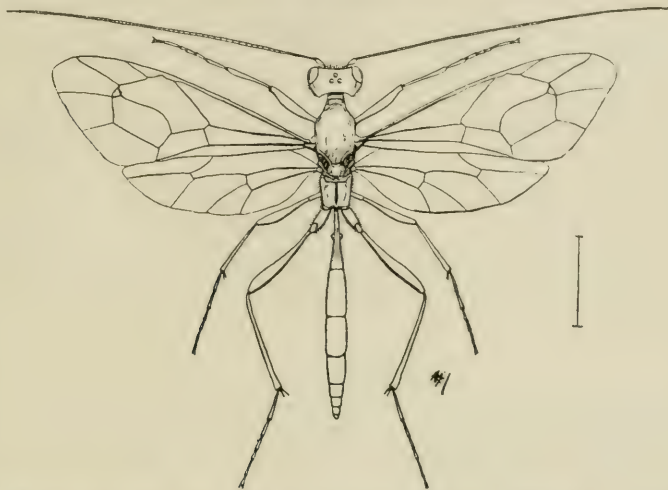
4. *typhae*, Fourc.

Ichneumon typhae, Fourc. E. P. ii. 413. *Mesoleptus typhae*, Voll. Pinac. pl. xxvi. fig. 6.

A somewhat slender species with the head a little constricted posteriorly; face and mouth flavous; clypeus punctate and hardly discreted. Antennae filiform, distinctly a little longer than the body, red with the flavous scape black, and flagellum sometimes infusate, above. Thorax immaculate black, with elongate but very superficial notauli and no pale callosities; metathorax not at all costate and with no areae; spiracles circular. Abdomen black with the central segments more or less broadly red, often black-marked, and the anal rarely red-margined; basal segment with no discal carinae, not laterally margined and hardly at all explanate apically. Legs red, with the anterior coxae and all the trochanters flavous; hind coxae black, femora entirely red, tibiae testaceous

with their apices not darker; hind femora slender. Wings subhyaline with stigma fulvous; areolet triangular, shortly but distinctly petiolate; fenestrae linearly discreted; nervellus intercepted at its centre. Length, 9—12 mm.

Very like the next species, with which it has hitherto been mixed in Britain, but distinctly smaller and more slender with no metathoracic nor petiolar carinae, the stigma paler and postpetiole not margined.



Pfankuch tells us that the typical ♀, together with varr. 1 and 4 of Gravenhorst's *Mesoleptus typhae* are lost, and that the typical ♂ is Kriechbaumer's *H. insignis*, which I have no doubt is synonymous with *H. villosulus*, Thoms. Subsequent authors have rendered the synonymy inextricable.

The present is our common British species and very probably that recorded in all our Lists and Catalogues. Lasingham (Marshall) and Acomb Wood, in Yorkshire (Wilson); common in Norfolk (Bridgman); Guestling (Bloomfield); Wimbledon (W. Saunders); near Hereford in July (Yerbury); Felden (Piffard); a full series from Shere (Capron); Lyndhurst in June (Adams); Tostock early in June (Tuck). I have taken it in the Bentley Woods near Ipswich towards the end of May, at the flowers of the wild blue hyacinth and hovering low over herbage; and swept it in the middle of June in marshy parts of Tuddenham Fen, Suffolk, and Burwell Fen, Cambs.

5. *villosulus*, Thoms.

Mesoleptus typhae, Gr. I. E. ii. 62, excell. ♀ et varr. (nec Fourc.). *Hadrodactylus villosulus*, Thoms. O. E. ix. 919 et xix. 1978, ♂ ♀. *H. insignis*, Kriech. Ent. Nachr. 1891, p. 141, ♂.

A distinctly stout species. Head not at all constricted posteriorly; face and mouth flavous, sometimes with the former black-lined; clypeus coarsely punctate and hardly discreted from the densely punctate face. Antennae filiform and hardly shorter than body, coloured as in the last

species. Thorax black with elongate and somewhat deeply impressed notauli, and flavous callosities before radices; metathorax centrally strongly bicarinate from its basal impression to near apex; lateral areae indicated; spiracles circular. Abdomen black with segments two to four entirely and part of fifth red, the remainder broadly red-margined; basal segment with strong discal carinae extending to centre of the distinctly margined and apically subexplanate postpetiole. Legs coloured as in the last species, but with apices of hind tibiae and their tarsi nigrescent and the hind femora subincrassate. Wings hyaline with the stigma piceous, areolet triangular and subsessile; fenestrae discreted only by a dot; nervellus intercepted at its centre. Length, 13 mm.

The largest and stoutest species of the group with distinct metanotal and petiolar carinae, the stigma piceous, hind tibiae apically nigrescent and areolet subsessile.

It is known from Sweden and Bavaria, and is certainly very rare in Britain, whence it has not hitherto been recorded. I possess two females, agreeing exactly with Pfankuch's description of Gravenhorst's typical male; they were swept from long rank herbage in a boggy spot in Rockland Broad, Norfolk, by myself on 10th June, 1901, and at Braemar on 19th July, 1907, by Mr. Ernest A. Elliott.

6. *fugax*, Grav.

Mesoleptus fugax, Gr. I. E. ii. 56; Ste. Ill. M. vii. 220; Fonsc. Ann. Soc. Fr. 1849, p. 213, ♂; Holmgr. Sv. Ak. Handl. 1855, p. 104; Voll. Pinac. pl. xxvi, fig. 8; Brisch. Schr. Nat. Ges. Danz. 1878, p. 67, ♀ ♂. *Hadrodactylus fugax*, Thoms. O. E. ix. 921 et xix. 1980, ♂ ♀.

A stout, pubescent and black species. Head large, not at all constricted posteriorly, with the mouth and a more or less broad apical stramineous facial mark on either side; frons strongly punctate; clypeus not discreted; lower mandibular tooth the longer. Antennae filiform, subattenuate towards their apices, black with usually only the scape flavous-marked beneath. Thorax stout, with pleurae punctate; mesonotum nitidulous, obsoletely punctate and evenly rounded throughout, with no notauli; metathorax subelongately pubescent, with its apical margin sinuate and elevated; metanotum very smooth with no trace of areae. Scutellum black. Abdomen shining, punctulate and black, more or less broadly rufescent, but usually with only incisures of the second to fourth segments red and venter concolorous; basal segment very smooth, nitidulous, convex and not very slender. Legs red with coxae, and usually base of trochanters, black; tibiae testaceous, with hind ones apically hardly subinfusate. Radix and tegulae stramineous; stigma testaceous; areolet small, petiolate and irregularly triangular; nervellus antefurcal, intercepted below its centre. Length, 9—11 mm.

A stout species, at once known by its basally black face which is often centrally concolorous, antefurcal nervellus and especially by the evenly rounded and nitidulous mesonotum and postpetiole.

It ranges through western Europe from Sweden to France; but is certainly uncommon with us, though extending at least from the Isle of Wight to Yorkshire. Hitherto it has only been recorded from Norfolk by Stephens, and from Norwich and Felthorpe there by Bridgman; but Miss Chawner has sent it me from the New Forest, Thornley from Cadney in Lincs.; Elliott took a male on 10th July, 1900, at Askrigg in

Yorks, and Foxcroft found it at Rannoch, in Perth; it occurred to me by sweeping at Tuddenham Fen and Belstead in Suffolk on 29th May; in a wood at Helpston Heath near Peterboro on 13th June; and at an altitude of 450 feet on Arreton Down on 23rd June (misnamed *M. typhae* in Morey's Guide to the Isle of Wight). Stenton takes it at Wimbledon in early June.

7. *xanthostigma*, Grav.

Mesoleptus xanthostigma, Gr. I. E. ii. 55; Ste. Ill. M. vii. 220; Holmgr. Sv. Ak. Handl. 1854, p. 64, ♂; l. c. 1855, p. 102; Brisch. Schr. Nat. Ges. Danz. 1878, p. 66, ♂ ♀. *Hadrodactylus xanthostigma*, Thoms. O. E. ix. 922 et xix. 1980, ♂ ♀.

Black and hardly shining. Head but slightly constricted posteriorly; mouth, clypeus and face stramineous; clypeus subdepressed and apically rounded; frons finely punctulate. Scape stramineous, and flagellum rufescent, beneath. Mesonotum nearly smooth, basally punctulate, with distinct notauli; hamate marks before radices, a callosity below them and a pectoral mark stramineous; metathorax rugulose, with the areola distinct and sometimes sulciform. Scutellum black. Abdomen centrally red, more broadly in ♀; ♂ with usually only the second and base of third segments black-marked castaneous; basal segment not very slender, scabriculous, discally distinctly sulcate, with spiracles almost before its centre; second segment dull, finely and closely punctulate or scabrous. Legs slender and red, with hind coxae black and apices of their femora and tibiae occasionally concolorous; anterior coxae and trochanters stramineous. Radix and tegulae stramineous; stigma dull testaceous or infusate; areolet irregularly triangular and subpetiolate; nervellus intercepted below its centre. Length, 8—10 mm.

Known by its dull, scabrous and sulcate petiole; Thomson considered it a form of transition between *Euryproctus* and the present genus.

It is said to occur in May, and ranges from Sweden to France and the Pyrenees, where Marshall has taken it. This species is recorded as found near London in June, but not common (Stephens); Nunton in Wilts in 1884; Botusfleming in Cornwall in 1891 and 1892 (Marshall coll.); and from the Lands End (Marquand). I possess but a single pair, swept in very wet situations in Tuddenham Fen on 19th June and Matley Bog in the New Forest on 16th of the same month.

8. *vulneratus*, Zett.

Tryphon vulneratus, Zett. I. L. 387, ♂. *Mesoleptus vulneratus*, Holmgr. Sv. Ak. Handl. 1855, p. 102; l. c. 1856, p. 375; Voll. Pinac. pl. xxvi, fig. 5; Brisch. Schr. Nat. Ges. Danz. 1878, p. 66 et 1892, p. 32, ♂ ♀. *M. curtus*, Holmgr. Sv. Ak. H. 1855, p. 105, ♂. *Hadrodactylus vulnerator*, Thoms. O. E. ix. 921 et xix. 1980, ♂ ♀.

Very closely punctate, slender and black with mouth, clypeus and face flavous. Head broader than thorax, a little constricted posteriorly; clypeus hardly discreted and apically rounded. Antennae very slender; scape flavous, flagellum rufescent, beneath. Thorax dull and immaculate; metathorax finely rugulose with upper areae indeterminate, areola elongate and subparallel-sided, confluent with the broader petiolar area. Scutellum black. Abdomen black and slender, with a discal and apically explanate streak of red on the third, fourth and usually second segments;

basal segment narrow and slender, subelongately pubescent, with central spiracles; ♀ anus compressed and sometimes entirely testaceous, as is always the terebra. Legs red with hind coxae, femora and apices of their tibiae usually nigrescent or black; anterior coxae and trochanters flavidous; hind trochanters flavous, centrally black-marked above; apical hind tarsal joint not half as long again as penultimate. Wings hyaline, tegulae flavous, stigma testaceous or flavescent and always pale; areolet hardly sessile, apically pellucid below, with fenestrae discreted only by a dot; nervellus intercepted below its centre. Length, 9—11 mm.

Known from its allies by its slender and more elongate body, but especially by the peculiar discal abdominal plaga; the central petiolar spiracles will separate it from the species of *Alexeter*.

Zetterstedt originally took it in Lapland in July; it is a northern species, hardly known outside Scandinavia and probably rarely extending south of Scotland with us. It was introduced by Bridgman (Trans. Ent. Soc. 1882, p. 155) on the strength of both sexes, taken at Thornhill near Dumfries, probably by Dr. Sharp. I have a male and three females; the first was swept in July by Elliott at Banchory in Kincardine and misnamed by me (E.M.M. 1910, p. 37) *M. xanthostigmus*; he also took a female at Braemar on 19th July, 1907, and Dalglish found others at Bishopton and Barr in Ayrshire in July, 1899. In June, 1901, I swept a couple of curiously pale females from low herbage in a marshy part of Tuddenham Fen; both have the abdomen and legs clear fulvous with the petiole and coxae alone black.

9. testaceus, Fab.

Ichneumon testaceus, Fab. E. S. Suppl. 1798, 228; Gr. Nov. Act. Acad. 1818, p. 285; *I. clavator*, Schr. F. B. ii. 295, ♂. *Bassus testaceus*, Fab. Piez. 101. *Mesoleptus testaceus*, Gr. I. E. ii. 28; i, Suppl. 682; Ste. Ill. M. vii. 216; Zett. I. L. i. 387; Boie, Nat. Tids. 1841, p. 323; Holmgr. Sv. Ak. Handl. 1855, p. 101; Voll. Pinac. pl. 26, fig. 2; Brisch. Schr. Nat. Danz. 1878, p. 65, ♂ ♀. *Mesolecius testaceus*, Holmgr. Sv. Ak. Handl. 1876, p. 126; Thoms. O. E. xvii. 1885, ♂ ♀. Var. *Mesoleptus melanocephalus*, Gr. I. E. ii. 28; i, Suppl. 682; Ste. Ill. M. vii. 216, ♂; Zett. I. L. 387; Holmgr. Sv. Ak. Handl. 1855, p. 100; Voll. Pinac. pl. xxvi, fig. 1; Brisch. Schr. Nat. Ges. Danz. 1878, p. 65, ♂ ♀. *Mesolecius melanocephalus*, Holmgr. Sv. Ak. Handl. 1876, p. 49; Thoms. O. E. xvii. 1884, ♂ ♀.

Not very shining, entirely testaceous with only the eyes, ocelli, and (in var.) frons with the submarginate occiput to the flavous cheeks, black. Head transverse, somewhat short and posteriorly constricted; clypeus subdiscreted, apically depressed and very slightly emarginate; frons deplanate and very finely rugulose. Antennae pale, filiform and subpilose; flagellum with 43—47 joints. Thorax narrower than head and paler below, with subhamate flavous callosities before radices; metathorax very finely punctate, pubescent, with no discal areae, and not narrowed towards its sinuate and subreflexed apex. Scutellum convex and flavidous. Abdomen narrow, with second and third segments longer than broad; spiracles of basal segment distinctly before its centre. Legs slender and fulvescent testaceous, with coxae and trochanters paler. Wings ample, stigma fulvous; areolet obliquely transverse and petiolate; nervellus intercepted a little below its centre. Length, 8—11 mm.

M. melanocephalus has hitherto been considered distinct, on account of its darker head, but even Thomson could find no more than colour difference.

The metathorax in ♀ is said to be occasionally infusate or both thorax and abdomen dark-marked; several of my specimens have the face longitudinally nigrescent centrally.

This species is not infrequent throughout the whole of Scandinavia, though there are no Scots records; it has been found upon umbells in Silesia in August, in Prussia, Belgium and France. Our records are somewhat scanty; both sexes at Netley in Salop (Hope); near Hertford, Dover, Darenth and Coombe Woods, "in June" (Stephens); Groveley Wood near Salisbury, Bishops Teignton in Devon and Botusfleming (Marshall coll.); Dousland in Devon, on 23rd August (Bignell); a full series from Shere (Capron coll.); Guestling (Bloomfield); New Forest (Miss Chawner). It would appear to be local and very restricted in its time of appearance, since the few that Elliott and I have taken, always by beating young birch trees, in Tuddenham Fen, Suffolk, have turned up only from 26th to 29th August, 1902-1906. Bridgman found only the type form at Norwich, and this has several times been bred, though the Lepidopterus hosts are, possibly, open to suspicion. First Boie in 1841 records it from *Tenthredo scalaris*, secondly Giraud in 1877 tells us Gooss raised it from *Eupithecia absinthiata*, thirdly Ratzeburg is said by Dalla Torre to have bred it from *Croesus septentrionalis*, and to these Gaulle adds *Rhogogaster punctulatus* and *R. viridis*, with which I have often seen it flying. In Britain Eedle is said (Entom. 1880, p. 68) to have bred it from the Noctuid, *Simyra venosa* and Bignell (Entom. 1881, p. 141) from *Eupithecia castigata*; the latter tells us (Trans. Devon. Assoc. 1898, p. 235) that the parasite emerged in south Devon on 31st October from a larva found on 20th September.

10. ruficornis, Grav.

Mesoleptus ruficornis, Gr. I. E. ii. 43; Ste. Ill. M. vii. 219; Holmgr. Sv. Ak. Handl. 1854, p. 67; l.c. 1855, p. 101; Voll. Pinac. pl. xxvi, fig. 4; Brisch. Schr. Nat. Ges. Danz. 1878, p. 65, ♂ ♀. *M. lugubris*, Woldst. Bidr. Finl. Nat. 1872, p. 31, ♀. *Mesoleius ruficornis*, Holmgr. Sv. Ak. Handl. 1876, p. 50; Thoms. O. E. xvii. 1885, ♂ ♀. Var. *Mesoleius comptus*, Holmgr. Sv. Ak. Handl. 1855, p. 165 ♂; Brisch. Phys. Ges. König. 1871, p. 82, ♂ ♀; cf. Thoms. l.c. Var. *Tryphon mutator*, Zett. I. L. i. 387, ♂ ♀.

A black species with the mouth, clypeus, and at least in ♂ face, pale flavous. Head somewhat narrowed behind the eyes; ♀ face sometimes black; clypeus apically depressed and very slightly emarginate. Antennae fulvescent at least beneath; scape of ♂ flavous below; flagellum with about 47 joints. Thorax very often more or less broadly rufescent or in ♂ flavidous-marked; metathorax very finely punctate, not apically narrowed, with obsolete discal areae and the petiolar rarely entire. Scutellum red. Abdomen centrally broadly red; basal segment with spiracles distinctly before its centre. Legs red with coxae, trochanters, hind femora and apices of their tibiae, black; anterior coxae and trochanters of ♂ flavous. Wings ample; stigma and tegulae flavescent; areolet entire, subtriangular and emitting recurrent nerve from its apex; nervellus intercepted below its centre. Length, 8-11 mm.

The thoracic colouration is very variable, and in var. *comptus* only the notauli and a pectoral mark are castaneous. It is our only species of *Alexeter* with the black abdomen centrally red, and hind femora black;

in its antemedial petiolar spiracles it is allied only to *M. testaceus* and the next species.

This species is frequent in marshy fields throughout Sweden and probably throughout Europe, in August and September, sometimes (says Grav.) upon umbelliferous flowers. It is very widely distributed but certainly not common with us, and has not been recorded hence since 1835. Near London "in June" (Stephens); Nunton, Cheltenham and Cornworthy in Devon (Marshall coll.); Hastings (Esam); several at Wimbledon in early August (Stenton); New Forest (Miss Chawner); Shere (Capron); a male at light at Withycombe near Taunton on 29th September, 1908 (Slater); Tostock in Suffolk late in 1898 (Tuck); Whitby in August (Beaumont). Banchory in September, 1910, Cromer and in profusion by the Tay at Birnam in Perth, 20th August, 1907 (Elliott); Nairn in August, 1904 (Yerbury); Barr in Ayrshire in July, 1899 (Dalglish); Whiting Bay in the Isle of Arran in September, 1903 (Waterston). Poyntzpass in Co. Armagh in 1910 (Johnson). I first took it by sweeping bracken at Matley Bog and Hinchelsea in the New Forest, in the middle of August, 1901; subsequently I swept a couple in Tuddenham Fen on 12th August, 1906; and on 18th October, 1908, a wholly testaceous ♀ of the maximum size flew in doors to light at Monks' Soham House, Suffolk, at 10.30 p.m.

11. *attenuatus*, Bridg.

Mesoleius attenuatus, Bridg. Trans. Ent. Soc. 1887, p. 371, ♂.

Head with face, mandibles and the apically subtruncate clypeus, flavous. Antennae filiform and longer than body, with scape flavous beneath. Thorax with radical callosities alone flavous; notauli distinct, mesonotum smooth and shining, its pleurae scabriculous and dull; metathorax with no areae. Scutellum black. Abdomen elongate and slender with segments two to four or three to five red and the ventral plica pale; basal segment with petiole slender, parallel-sided, twice longer than broad; postpetiole a little longer but apically very little broader, finely scabriculous, not sulcate, and apically shining; second and third of equal length and finely scabriculous; remainder transverse. Legs red with trochanters except the black base of hind ones, and apices of the anterior coxae, flavous; hind tarsi, apical third of their tibiae and extreme apices of their femora nigrescent, two apical joints of their tarsi subequal in length. Wings with tegulae flavous, areolet present; nervellus intercepted at its centre. Length, 8 mm. ♂ ♀.

"It belongs to Sect. A. of *Mesoleptus* of Holmgren's Mon. Tryph. Suec., which division he afterwards placed in the genus *Mesoleius* (Disp. Syn. Mesol. Scand.), and is very distinct from any of the group" (Bridg. l. c.); hence it must be relegated to *Alexeter*.

One male was taken by Mr. E. Brunetti and given by him to Bridgman, with no locality, though certainly British. It is probably in the Norwich Castle Museum. It is an uncommon species, much mixed with *M. typhae* from which the antennal colouration and apically black hind femora sufficiently separate it. I have taken a couple of males in the Suffolk Bentley Woods, and Mr. W. W. Esam has given me a single female, found in the Hastings district about 1899.

12. *cingulatus*, Grav.

Mesoleptus cingulatus, Gr. I. E. ii. 22; Ste. Ill. M. vii. 215; Fonsc. Ann. Soc. Fr. 1849, p. 211, ♂; Holmgr. Sv. Ak. Handl. 1855, p. 103; Voll. Pinac. pl. xxvi, fig. 7; Brisch. Schr. Nat. Ges. Danz. 1878, p. 67 et 1892, p. 32; Thoms. O. E. ix. 922, ♂ ♀. *M. undecim-notatus*, Desv. Cat. 33, ♂. *M. submarginatus*, Ste. Ill. M. vii. 214, ♀.

A slender black species, with red legs. Head transverse and constricted posteriorly; clypeus, mouth and face stramineous, with the last in ♀ sometimes black-lined; clypeus strongly punctate, apically depressed and rounded; frons finely punctulate; lower mandibular tooth the longer. Antennae fine, not elongate; scape stramineous, and flagellum testaceous, beneath. Thorax black; ♂ with subhamate lines before radices, mesosternum and often pronotum apically, stramineous; ♀ usually with mesonotum discally and mesosternum fulvidous; metathorax scabriculous, coarser apically, with upper areae obsolete or wanting; petiolar area longitudinally carinate centrally. Scutellum of ♂ stramineous, of ♀ fulvidous. Abdomen narrow, black with only the apices of all the segments and the venter stramineous; basal segment narrow and slender; anus of ♀ subcompressed. Legs slender and fulvous, with hind tarsi and apices of their paler tibiae alone nigrescent; hind trochanters centrally and extreme apex of their coxae rarely infusate. Stigma testaceous; areolet wanting; nervellus intercepted below its centre. Length, $7\frac{1}{2}$ —9 mm.

Distinct in its lack of areolet and black, flavous-banded abdomen. I have seen Stephens' and Desvignes' types.

It is not an uncommon species throughout western Europe, bred by Brischke in Prussia from cocoons of *Tenthredo scalaris* (*Rhogogaster viridis*), and thought by Fonscolombe to occur as early as April in France. With us it can hardly be termed common, though Bridgman says he found it so in Norfolk. Hertford in July, 1835, and not common at Darenth and Coombe Woods in June (Stephens); Tostock in July (Tuck); several at Shere (Capron); Felden (Piffard); and Lyndhurst in New Forest (Adams), where I took it at Wilverley on 11th July, 1909. It has also occurred to me by sweeping in a wood at Helpston Heath near Peterboro, upon the tables of *Heracleum sphondylium* at Monks' Soham in August, and in the Bramford Marshes near Ipswich in both June and July.

13. *prosoleucus*, Grav.

Ichneumon prosoleucus, Gr. Mem. Ac. Sc. Torin. 1820, p. 363, ♀. *Mesoleptus prosoleucus*, Gr. I. E. ii. 58, ♀; cf. Pfank. Zeits. Hym.-Dip. 1906, p. 25. *M. Holmgreni*, Thoms. O. E. xix. 1982, ♂ ♀. *M. similis*, Brisch. Schr. Nat. Ges. Danz. 1878, p. 66, ♂ ♀.

Head posteriorly constricted with the face except a central line, frontal orbits, clypeus, cheeks and mouth flavous; clypeus apically subtruncate, depressed, transversely impressed and shining; frons broad and dull. Scape and basal half of flagellum flavous beneath. Notauli elongate and deeper basally; elongate prothoracic callosity and lines before radices, with dots below them, flavous; metathorax scabrous, centrally subbicarinate. Abdomen black with segments three to five or six, more or less of second, and extreme apices of the anal red, sometimes didymated with black; basal segment elongate and narrow, not carinate, with central and

prominent spiracles. Legs slender, the anterior pale testaceous with the dark-marked coxae and trochanters flavous; hind ones dull flavidous with coxae and base of trochanters black, the tarsi with apices of their tibiae nigrescent; base and apex or upper side of hind femora often infusate; calcaria elongate and white. Stigma and tegulae flavidous; areolet wanting; nervellus antefurcal, intercepted below centre. Length, 8—9 mm.

The sternum is sometimes apically, with rarely the extreme apex of scutellum, flavous.

It is known from Piedmont, Switzerland, Sweden and France, so no reason is apparent for absence from Britain. I should, however, have had some hesitation in depending upon Desvignes' record of this species as British, through specimens in Curtis' collection, were it not that Elliott took a ♀ at Braemar on 22nd August, 1907, and Piffard has given me a ♂ (differing in nothing but the peculiarly dentiform petiolar spiracles) from Felden, near Boxmoor, in Herts during 1899. I have no doubt that Brischke's species, recorded from Britain (Trans. Ent. Soc. 1882, p. 155) and taken at Bickleigh by Bignell at the end of June, 1881, is correctly here synonymised; there is also a specimen from Lidford in Marshall's collection, Yerbury has given me a ♀ from Barmouth at the end of June and I took another sucking the stylopods of *Angelica sylvestris* at Brandon as late as 28th September, 1907. Stenton turned up a pair at Wimbledon as late as 6th October, 1910.

14. *leptocerus*, Grav.

Ichneumon leptocerus, Gr. Mem. Ac. Sc. Torin. 1820, p. 365. *Mesoleptus leptocerus*, Gr. I. E. ii. 68, ♂ (*sic* ♀). *Phobetres leptocerus*, Pfank. Zeits. Hym.-Dip. 1906, p. 28, ♂ (*nec* Thoms.).

Head posteriorly but little constricted with only clypeus and mouth, except apices of mandibles, which have lower tooth the longer, flavous. Antennae slender, fully as long as body, with scape flavous beneath. A flavous callosity beneath radices; areola narrow and slightly constricted at base and apex. Abdomen elongate, black with the three basal segments and part of fourth flavescent red, darker in ♀; basal segment elongate, with feeble carinae extending to the spiracles. Anterior legs flavescent, with their coxae and all the trochanters stramineous white; hind coxae and their femora testaceous, extreme apices of latter black; hind tibiae dull flavous with their apices broadly, and tarsi, black; calcaria white and elongate. Stigma dark ferrugineous, radix and tegulae flavous; areolet wanting. Length, 9—10 mm. ♂ ♀.

This species has much the facies of *Alexeter*; it is at once known by its black face, basally pale abdomen and lack of areolet.

All previous records, but the original one from Piedmont, are doubtful. There is a single ♀, described above, in Marshall's collection from Botusfleming in Cornwall; two from Desvignes' in the British Museum; and Bignell says he captured it at Plym Bridge in Devon on 21st September, but this was probably named by Bridgman and is more likely referable to Thomson's species, which Pfankuch says is distinct from the present and I have seen nothing like it.*

* I do not know upon what grounds Marshall included *Mesoleptus cerinostomus*, Grav. I.E. ii. 61, ♂, in his 1870 British list. No one was able to recognise it till the type was examined and thought to belong to *Phobetres* by Pfankuch in 1906. There are no indigenous records and it were better omitted until further evidence be forthcoming.

15. *macrodactylus*, Holmgr.

Mesoleptus macrodactylus, Holmgr. Sv. Ak. Handl. 1854, p. 68; *l.c.* 1855, p. 106, ♂; Brisch. Schr. Phys. Ges. König. 1871, p. 66; Schr. Nat. Ges. Danz. 1878, p. 68, ♂ ♀. *M. scutellatus*, Bridg. Trans. Ent. Soc. 1886, p. 356, ♀. *Hadrodactylus macrodactylus*, Thoms. O. E. ix. 922. *Gausocentrus macrodactylus*, Thoms. O. E. xix. 1981, ♂ ♀.

Head transverse and not constricted posteriorly; mouth, clypeus, and face pale, ♀ face triangularly black basally; clypeus discreted, finely punctate, apically depressed and subtruncate; frons closely punctate. Antennae longer than body, and red with scape flavous beneath. Thorax black with ♂ pronotum sometimes apically flavous; notauli somewhat distinct apically; pleurae shining and sparsely punctate, epicnemial elevated; metathorax somewhat convex, smooth, pubescent with no trace of areae. Scutellum convex and, like postscutellum, flavous. Abdomen elongate-clavate and black with second to fourth segments red; basal segment nearly smooth, with central spiracles and no discal carinae; terebra black. Legs stout and red; all trochanters red, hind coxae entirely and the anterior partly black; hind legs stout, with the claws large and curved. Stigma dull testaceous, tegulae pale; areolet triangular, petiolate and small; nervellus postfurcal, intercepted a little above the centre. Length, 7—8 mm.

Very like the next species and perhaps no more than a colour variety of it; together they are known from the remainder of this genus by the peculiarly large claws of their stout legs, which are nearly as thick as in the genus *Tryphon*, and by the pale scutellum.

It is widely distributed in western Europe and was described as a new species by Bridgman from Horning Ferry in the Norfolk Broads, where he took it on 29th June, 1882 (a co-type, bearing this date, is in Marshall's collection), but subsequently (Trans. Norf. Soc. v, p. 624) he synonymised it as above. Certainly a very rare species with us, and I possess but a single pair, of which the male was found at Tostock in Suffolk at the middle of July, 1900, by Tuck; and the female was swept by myself at Rhinefields in the New Forest on 12th July, 1909. Stenton took a female at Wimbledon on 10th August, 1910.

16. *sordidus*, Grav.

Mesoleptus sordidus, Gr. I. E. ii. 36, ♂. *Gausocentrus sordidus*, Thoms. O. E. xix. 1981.

Face dull infusate, mouth alone testaceous. Antennae filiform and slender, longer than body, ferrugineous becoming infusate above; thorax immaculate black. Scutellum and postscutellum dull testaceous. Abdomen elongate-clavate and black with second to fourth segments testaceous, the second discally and fourth apically infusate; basal segment elongate. Legs testaceous with the coxae black or anterior castaneous; hind femora incrassate and castaneous with tarsi entirely, and their stramineous tibiae at both extremities, nigrescent. Stigma and radius black, radix and tegulae stramineous; areolet irregular and petiolate. Length, 8 mm.

This species is said by Thomson, who has correctly recognised it [says Pfankuch], to be quite similar to *M. macrodactylus* in size and outline, but

with all the coxae and the hind femora black ; I suspect them of synonymy, in spite of the facial colouration.

It has occurred in Germany, France and Belgium. With us it was recorded as indigenous by Desvignes in 1856 on the strength of specimens in Curtis' collection. It certainly requires confirmation as British.

17. *glacialis*, Woldst.

Mesoleptus glacialis, Woldst. Bidr. Kän. Finl. Natur. 1874, p. 33, ♀.

A shining and pubescent black species. Head somewhat constricted posteriorly and broader than thorax with mouth, clypeus, apices of cheeks and face, except longitudinally in the centre, stramineous; clypeus apically subdepressed and very slightly emarginate. Scape stramineous, and flagellum red, beneath. Thorax black with prosternum and radical callosities flavous; metanotal areae strongly incomplete. Abdomen black, with its centre red; basal segment narrow and not sulcate, with subcentral spiracles. Legs slender and red; anterior coxae and trochanters pale flavous; hind tarsi, coxae, apices of tibiae and base of trochanters nigrescent. Areolet wanting; tegulae stramineous, stigma pale; nervellus intercepted below centre. Length, 7—8 mm.

It appears to me to differ from *M. xanthostigma* in little but its lack of areolet.

This Finnish species was introduced as British by Bridgman (Trans. Ent. Soc. 1889, p. 432) on the strength of two specimens, taken by the Rev. T. A. Marshall near Abergavenny in Monmouth; one of these is still in the latter's collection in Mus. Brit., labelled "Govilon." An unlocalised ♀ in the National Collection was, I think correctly, considered a variety of *M. xanthostigma* by Desvignes.

PERISPUDUS, Thomson.

Thoms. O. E. vii. 1873; (?) *Perispuda*, Först. Verh. pr. Rheinl. 1868, p. 205.

Body large and black, sometimes centre of abdomen and the legs mainly pale. Head with the vertex somewhat broad. Thoracic notauli vaguely impressed; metathorax with the petiolar area short and entire, and the longitudinal carinae not very distinct. Abdomen with the petiole elongate and spiracles a little before centre of the basal segment. Mesopleurae somewhat closely punctate with the speculum glittering. Wings with the basal nervure oblique and the areolet small, petiolate; hind wings with the nervellus elongately postfurcal.

The genus was treated of under *Mesoleptus* by Holmgren and in our own catalogues, but Thomson in 1893 and 1895 placed both our species in it as a subgenus of *Mesoleius* from which it differs, besides the whole of the characters given above, in the very obviously petiolate first segment, in respect to which I think it better placed among the Mesoleptini. *Tryphon flavipes*, Grav., said to belong to this genus by Pfankuch, has been given as British by our older authors, but almost certainly in error.

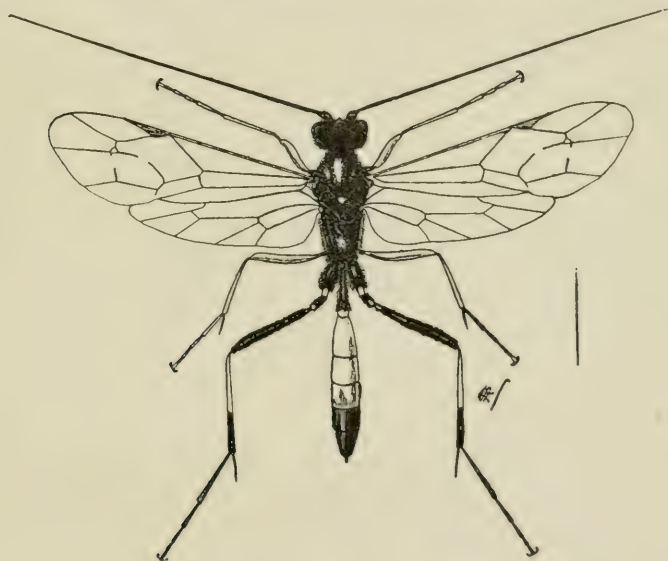
Table of Species.

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|------|---|-----------------------|
| (2). | 1. Femora black ; abdomen broadly flavous | 1. SULPHURATUS, Grav. |
| (1). | 2. Femora red ; abdomen entirely black | 2. FACIALIS, Grav. |

1. *sulphuratus*, Grav.

Ichneumon sulphuratus, Gr. Vergl. Ubers. Zool. Syst. 1807, p. 258; Nov. Act. Acad. 1818, p. 285. *Mesoleptus sulphuratus*, Gr. I. E. ii. 81; i, Suppl. 685; Ste. Ill. M. vii. 225, ♂ ♀; Fonsc. Ann. Soc. Fr. 1849, p. 115, ♂. *Perispudus sulphuratus*, Thoms. O. E. xix. 2022, ♂ ♀. Var. *Mesoleius Bignellii*, Bridg. Trans. Ent. Soc. 1881, p. 163, pl. viii, fig. 12, ♀.

A handsome black species, with centrally pale abdomen and flavous tibiae. Head strongly punctate, of ♂ with face and mouth except apices of mandibles flavous, of ♀ immaculate or rarely with palpi and mandibular marks pale; clypeus apically truncate and laterally oblique. Antennae subsetaceous and a little shorter than body; scape and pedicellus black, in ♂ flavous-marked beneath; flagellum rufescent, in ♂ infuscate above. Thorax immaculate; mesopleurae strongly sculptured



and subcoriaceous; metathorax coriaceous, impressed before postscutellum, with no areae; spiracles broad oval. Abdomen elongate-fusiform, nearly double length of head and thorax, and not broader than latter; of ♀ red and of ♂ flavous, both with first segment except apically and apex of fourth to anus black; basal segment smooth, gradually slightly dilated apically, with subprominent and central spiracles; postpetiole not extending beyond the ventral membrane, and hardly margined posteriorly on either side; anus of ♀ clavately compressed, with valvulae apically testaceous. Legs red with hind coxae and femora black, all the tibiae stramineous with apices of hind ones, and base of ♀ anterior femora broadly, black; hind tarsi apically infuscate; ♂ with anterior coxae, and all the trochanters, often black and sometimes flavous-marked; ♀ with all coxae and trochanters black. Wings subflavescent; stigma and radius fulvous, tegulae black and radix of ♂ paler; areolet petiolate and tri-

angular, with its outer nervure pellucid below; fenestrae confluent; lower wings with first abscissa of radius half as long again as recurrent nervure; nervellus intercepted above centre. Length, $9\frac{1}{2}$ —13 mm.

Thomson places this species in his subgenus *Perispudus* of *Mesoleius*. I have a ♂ with the face only flavous longitudinally in the centre.

It seems improbable both from his description and figure that Bridgman's female is more than a variety of *P. sulphuratus*; he says (*loc. cit.*) that it differs in having the head narrower posteriorly, the notauli deeper, the basal segment much shorter and slightly broader with the following much shorter, the antennae black and tarsi paler. Bignell tells us in 1898 that the single ♀ described was captured at Bickleigh near Plymouth on 11th August, 1880, and another, twelve years later, in Scotland. It is thus described:—Head reticulate, immaculate, narrow behind eyes; antennae as long as body, entirely black. Thorax immaculate, distinctly punctate with reticulate interstices; notauli distinct; metathorax rugose with no areae. Abdomen black with the subquadrate second and subtransverse third, with extreme apex of the reticulate and very sparsely punctate first segment, whose spiracles are just behind centre, red. Legs clear flavous with coxae, trochanters, base of anterior and whole of hind femora, and apical third of hind tibiae, black. Wings fulvescent; tegulae black, stigma pale testaceous, nervures fulvous; areolet small, petiolate, emitting recurrent nervure beyond centre; nervellus intercepted above centre. Length, 12 mm.

Both sexes were recorded from Germany in the middle of July by Gravenhorst; Fonscolombe found the male about Aix in France; and Thomson records it from Sweden. It is probably local and restricted to very marshy situations. Hope sent a single pair to Grav. from Netley in Shropshire; Stephens considered it "rare: taken near London, in June"; there is one from Govilon in Monmouth in Marshall's collection; Bridgman found it at Brundall in August; Beaumont at Whitby on 14th August, 1897; and Morice at Horsell in Surrey on 7th Sept., 1903. My dozen examples are mainly from Barnby and Oulton Broads, and Tud-denham Fen, in Suffolk, where it is not rare, usually swept from marsh grasses and *Juncus*, though occasionally on the flowers of *Angelica*, from 5th July to 8th September, when it was swept by Bedwell. All these are males and another turned up in Lyndhurst in the New Forest in 1901; my only females were captured at Wimbledon Common in August, 1910, by Stenton, Lynton in Devon in 1890 by Stanley Edwards, and at the Mound in Sutherland on 16th August, 1900, by Col. Yerbury.

2. *facialis*, Grav.

Mesoleptus facialis, Gr. I. E. ii. 12; Capron, Entom. 1884, p. 46, ♂. *Mesoleius facialis*, Thoms. O. E. xii. 1261; l. c. xvii. 1873, ♂ ♀. *Perispuda facialis*, Kriech. Ent. Nachr. 1891, p. 42, ♂ ♀.

An elongate, stout black species, shining and obsoletely pubescent. Head transverse and not buccate, with vertex somewhat broad; ♂ with whole face and mouth, except mandibular apices, white; mandibles apically obtuse, with the upper tooth very slightly the longer, and in ♀ alone pale. Antennae hardly shorter than body, subtestaceous and black, with the flagellum except basally testaceous beneath; six joints beyond their centre at least in ♂ entirely, and sometimes the ♂ scape beneath, white.

Thorax immaculate, with superficial notauli; mesopleurae closely punctate, speculum glittering; discal metanotal areae indistinct; petiolar area short and entire. Abdomen oblong, immaculate black; basal segment stout, elongate, gradually dilated towards its apex, obsoletely margined laterally, with prominent spiracles a little before the centre; terebra not short. Legs somewhat slender, elongate and red; coxae and trochanters black, with front ones rarely flavous beneath; anterior tibiae internally flavidous and the hind ones with at least their apical half, and whole tarsi, black; anterior tarsi whitish. Wings normal, slightly clouded, with stigma dull testaceous, radix and tegulae nigrescent; areolet obsolete or very small, apically incomplete, irregularly triangular and elongately petiolate; basal nervure oblique; nervellus elongately postfurcal, intercepted far above centre. Length, 11—13½ mm.

Thomson says the antennae are pale-banded in both sexes; my ♀♀ lack all trace of annulation, but Rev. F. D. Morice took a ♀ with such a band at Sunningdale in Berks on 6th June, 1903.

A male from Genoa (Grav.), central and southern Sweden (Thoms.), Germany (Kriech.), Belgium (Tosquinet) and France (Gaulle). It was introduced by Dr. Capron (Entom. 1884, p. 46) as British on the strength of a male he took at Shere in Surrey during that year; this, with a smaller one, is in his collection. Marshall noted, in MS., that it was "Taken at Ivybridge repeatedly by Bignell and by me at Botusfleming" in Cornwall; there is a male from the latter locality in his collection; Bignell took it at the former on 31st May, and Stenton found a male at Wimbledon on 3rd June, 1910. It appears to be confined to the south of the Thames, and neither Bridgman nor I have seen it in East Anglia. Besides Capron's males I only possess the same sex, undoubtedly much the commoner, from Wimbledon where Sich took two flying over honeysuckle on 25th May, 1901; St. Ervan in Cornwall where Davies found it in June, 1904; and several of both sexes from St. Andrew and Guernsey, captured by Luff towards the end of July, 1908.

CATOLYPTUS, *Holmgren*.

Holmgr. Sv. Ak. Handl. 1855, p. 106.

Head transverse and not buccate with vertex a little emarginate; clypeus subelevated and laterally foveate; lower mandibular tooth always decidedly the longer; eyes entire. Antennae filiform and apically attenuate; flagellum with 45—50 joints; scape ovate. Notauli generally distinct; metanotal areae more or less entire; spiracles circular. Scutellum subconvex. Basal segment somewhat curved, petiolate with postpetiole explanate; pygidium in both sexes entire; terebra shortly exerted and distinctly reflexed. Legs slender with femoral apices nearly always attenuate, hind femora occasionally incrassate; tarsal claws simple. Wings with very rarely a trace of areolet.

This genus is allied to Holmgren's *Euryproctus* and *Notopygus* in the curved basal segment, with distinctly slender petiole and gradually explanate postpetiole, but differs from the former in its unequal teeth and curved terebra, from the latter in the ventral emission of the terebra and unemarginate apical segments. In 1883, Thomson divided this genus into four sections founded on the capital excavation and these he erected

into three subgenera in 1895; though usually acknowledged as genera, the distinctions are small and our species may here be treated in the broader sense.*

Table of Species.

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|------|----|--------------------------------------|------------------------------|
| (2). | 1. | Hind femora very strongly intumesc- | |
| | | cent | 1. FORTIPES, <i>Grav.</i> |
| (1). | 2. | Hind femora normal, not or hardly | |
| | | incrassate. | |
| (4). | 3. | Vertex not excavate; ♀ flagellum | |
| | | tricoloured | 2. ANTILOPE, <i>Grav.</i> |
| (3). | 4. | Vertex laterally excavate; flagellum | |
| | | not tricoloured. | |
| (6). | 5. | Costulae and occipital carina entire | 3. DELUSOR, <i>Linn.</i> |
| (5). | 6. | Costulae wanting; occipital carina | |
| | | interrupted | 4. FUSCICORNIS, <i>Gmel.</i> |

1. fortipes, Grav.

Mesoleptus fortipes, Gr. I. E. ii. 85; Ste. Ill. M. vii. 225, ♂ ♀. *Catoglyptus fortipes*, Holmgr. Sv. Ak. Handl. 1855, p. 106, pl. viii, fig. 2; Brisch. Schr. Nat. Ges. Danz. 1878, p. 68; Thoms. O. E. ix. 923, ♂ ♀. Var. *C. crassipes*, Holmgr. Sv. Ak. Handl. 1855, p. 107, ♂ ♀; *C. grossipes*, Thoms. O. E. ix. 923, ♂ ♀.

A little shining, finely punctulate and black. Head slightly constricted posteriorly; mouth and face of ♂ entirely stramineous, former alone testaceous in ♀; frons smooth; clypeus depressed but not discreted basally, and apically subtruncate with deep lateral foveae; lower mandibular tooth the longer. Antennae filiform, not slender, distinctly shorter than body; red with scape and upper side of flagellum black, former in ♂ flavous beneath. Thorax stout, punctulate and pubescent, with almost wanting notauli; three distinct metanotal areae, areola sulciform and strong, dentiparal externally weak; spiracles large and oval. Scutellum convex and black. Abdomen deep red, nitidulous with first segment alone black; of ♀ ovate, of ♂ fusiform; basal segment apically strongly explanate, basally linear, canaliculate between and subconstricted beyond the prominent central spiracles; terebra black, distinctly exerted and strongly reflexed. Legs incrassate, pale flavous; hind ones of ♂ with coxae, trochanters and base of the bright red femora above, whole of their tibiae and tarsi, black; ♀ with all coxae, trochanters, hind tibiae, their tarsi, and base of all the femora broadly, black; hind femora very strongly inflated. Radix stramineous, tegulae of ♂ apically concolorous; stigma narrow and dark ferrugineous; areolet wanting; nervellus intercepted below its centre. Length, $8\frac{1}{2}$ —11 mm.

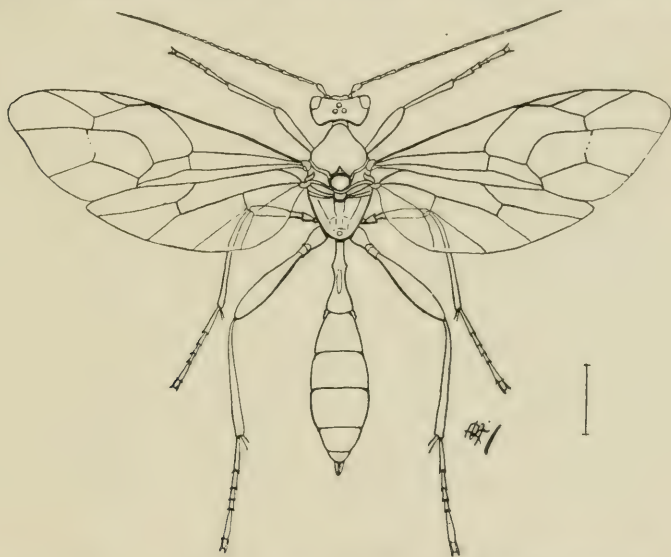
The peculiar manner in which the hind coxal flavesence runs beneath their femora is remarkable. The intumescent hind femora render this species unmistakable.

This intumescence is only shared by *C. crassipes*, which I cannot think is more than a form of the present species with the hind femora entirely

* *Tryphon iratus*, Gr. (I.E. ii. 287, ♂) was recorded as British by Marshall in his 1870 Catalogue, but I do not know upon what authority. It is not in Mus. Brit. and he evidently had no personal acquaintance with it or he would not have left it, placed alphabetically, in that genus in 1872. Pfankuch tells us it is a *Stiphrosomus*, very closely allied to *Catoglyptus antilope* and synonymous with *C. scaber*, Brisch. (Schr. Nat. Ges. Danz. 1878, p. 68, ♂). It is not known outside Germany and better omitted from our List.

or nearly entirely black; Holmgren says the basal segment is somewhat shorter and slightly depressed beyond its centre, but this is not very apparent. The only indigenous specimen is a ♂, taken by Champion (cf. Trans. Ent. Soc. 1887, p. 369) in the London district.

C. fortipes occurs through France, Germany, Belgium, Austria, Italy and Sweden. Nothing whatever is known of its economy or habits though it is, as Stephens says, "not very uncommon in several parts of the country, in June and July"; but certainly rare in East Anglia, where I have not met with it. Two females at Netley (Hope); New Forest, Coombe and Darenth Woods (Steph.); Shere in Surrey (Capron, Entom. 188c, p. 87); Ripley on 4th June (Morice); Blackburn (Bowdler); Linwood in Lincs. and Tresswell Wood, Notts, 15th June (Thornley); Kings



Lynn (Atmore); Botusfleming, Cornworthy, Lydford, Govilon and Lastingham in Yorks (Marshall coll.); Norwich and Brundall (Bridg.); Horrabridge, 30th June (Bignell); Bewdley (W. Ellis); New Forest, several (Miss Chawner); Felden, several (Piffard); Shepton Mallet, Somerset (Charbonnier). Cambuslang, 22nd June, 1899 (Dalglish); Braemar, 19th July, 1907 (Elliott); Aviemore in 1876 (Champion). Poyntzpass in Armagh, 26th June, 1907, and Cave Hill, Belfast, 1910 (Rev. W. F. Johnson). Llandrindod in Radnor and Aberglaslyn, in Wales (Elliott).

2. antilope, Grav.

Mesoleptus antilope, Gr. I. E. ii. 104; Ste. Ill. M. vii. 229, ♀. *Catoglyptus pulchricornis*, Holmgr. Sv. Ak. Handl. 1855, p. 109, ♀. *C. antilope*, Brisch. Sv. Ak. Handl. 1878, p. 69, ♀; Thoms. O. E. ix. 923, ♂ ♀. *Stiphrosomus Antilope*, Thoms. l. c. xix. 1973, ♂ ♀.

A dull species with antennae shorter than body, tricoloured in ♀, and verticillate in ♂, and the abdomen nearly entirely red. Head with palpi stramineous, mandibles centrally pale and the face often rosy above, of

♂ also with whole face and clypeus stramineous. Antennae of ♀ much shorter than body, subfiliform with the flagellum basally red and centrally white-banded, of ♂ black and attenuate with apical joints discreted and setiferous. Thorax dull black and deplanate; mesonotum of ♀ often with two red vittae; metanotum scabrous with complete areae, petiolar area short and areola very narrow, parallel-sided. Scutellum and post-scutellum of ♀ usually rosy apically. Abdomen red, strongly petiolate, of ♀ with 5th segment to apex, or also petiole, alone black, of ♂ with 3rd and apex of 2nd and base of 4th alone red; basal segment elongately and strongly bicarinate, with subcentral spiracles and, like the second distinctly granulate. Legs not stout, red with the ♂, and rarely hind ♀, coxae black; hind femora either at extreme apex, or except their base, nigrescent; hind tarsi fulvous. Wings hyaline, with radix and tegulae stramineous, latter piceous in ♂; stigma piceous, basally paler; areolet wanting or traceable. Length, 6—8 mm.

This description is drawn from eight ♀♀ and one ♂ (all that are known as British), of which two of the former and the right wing alone of the latter bear areolet. Thomson distinguishes this species from the rest of its genus by the lack of vertical excavation and areolet, the distinct notauli and apically verticillate-pilose ♂ flagellum, later pointing out that the short vertex is angulated behind the eyes, pleurae coriaceous with polished speculum, antennae of ♀ short and at most with 25 joints, the upper wings not long with basal nervure antefurcal and not curved above, radius apically straight, nervellus oblique below centre.

Ranges through Norway, Sweden, Germany, Belgium and France. Stephens found a female near London in June or July, possessed another from Donovan's collection and a third is in Desvignes'. It was introduced as new to Britain by Bridgman under Holmgren's name (Tr. Ent. Soc. 1887, p. 369), which he had already thought synonymous with *M. antilope* (*loc. cit.* 1882, p. 155), on the strength of examples of both sexes, recorded by Capron from the vicinity of Shere in Surrey (Entom. 1880, p. 87); these are the specimens here described.

3. *delusor*, Linn.

Ichneumon delusor, Linn. S.N. 1758. 564; Jur. Nouv. Meth. 110, ♂. *Anomalon delusor*, Trentep. Isis, 1826, p. 299, ♀. *Mesoleptus delusor*, Gr. I. E. ii. 83; Ste. Illus. M. vii. 225; Blanch. Hist. Ins. iii. 307, ♀. *Cataglyptus delusor*, Thoms. O. E. ix. 923. *Asthenarus delusor*, Thoms. l.c. xix. 1875, ♀.

Head entirely black; clypeus nitidulous, with large foveae; frons apically impressed. Antennae a little shorter than body, black. Thorax immaculate, with distinct notauli; metathorax with complete areae. Abdomen as long and as broad as head and thorax, oblong-ovate, flavidous-red with the first segment except apically, and sometimes the sixth to apex, black; all segments broadly flavous-margined; basal segment rugose with carinae extending to the gradually explanate postpetiole, spiracles prominent and beyond its centre; terebra slender, slightly reflexed, extending to anus, and apically acuminate. Legs normal and red, with all coxae and trochanters black; hind legs with tarsi and apices of both tibiae and femora nigrescent; apical tarsal joint not stout; hind femora and calcaria stout, but not incrassate. Wings slightly clouded, stigma and radius infuscate, radix and tegulae stramineous; areolet wanting or small and petiolate. Length, $6\frac{1}{2}$ mm. ♀ only.

It is said to differ from the rest of the genus in its size and in having the occipital carina not interrupted, in an impressed frontal fovea above the antennae, with costulae and all metathoracic areae very conspicuous.

Germany (Grav.), Sweden (Thoms.) and France (Gaulle). "Rare: found in June near London" (Stephens, who entered it in his Catalogue under the genus *Ophion*). This is the only record we possess and I must own I do not understand the species, which is not now contained in Stephens' collection.

4. *fuscicornis*, Gmel.

Ichneumon fuscicornis, Gmel. S. N. 1790, 2701. *Mesoleptus nemoralis*, Gr. I. E. ii. 70, excl. ♀. *M. fuscicornis*, Gr. lib. cit. ii. 87; Ste. Ill. M. vii. 226, ♀. *Cataglyphus fuscicornis*, Holmgr. Sv. Ak. Handl. 1855, p. 108, cf. l.c. 1856, p. 377; Kriech. Ent. Nachr. 1897, p. 122; Thoms. O. E. ix. 923, ♂ ♀. *Stiphrosomus fuscicornis*, Thoms. l.c. xix. 1973. Var. *M. montanus*, Gr. I. E. ii. 82, ♀; *C. montanus*, Holmgr. Sv. Ak. Handl. 1855, p. 108; Brisch. Schr. Nat. Ges. Danz. 1887, p. 87; *S. montanus*, Thoms. O. E. xix. 1974, ♂ ♀. Var. *M. nemoralis*, var. 3, Gr. I. E. ii. 70, ♂; *M. foveolator*, Holmgr. Sv. Ak. Handl. 1854, p. 64; *C. foveolator*, Holmgr. l.c. 1855, p. 108; Kriech. Ent. Nachr. 1897, p. 122; Thoms. O. E. ix. 923, ♂ ♀; *S. foveolator*, Thoms. l.c. xix. 1973. *Mesoleptus Waltoni*, Curt. B. E. pl. dclxiv, ♂. *M. mirabilis*, Ste. Ill. M. vii. 223, ♂.

A nitidulous and finely punctate species with the abdomen, except basally and in ♂ apically, red with the antennae of ♀ not white-banded and of ♂ verticillate-pilose. Head with the mouth and in ♂ either whole clypeus and face or only the facial orbits flavous; vertex impressed on either side. Antennae of ♀ filiform and much shorter than body, testaceous below; of ♂ nearly as long as body, setiferous throughout and black, more or less broadly pale basally beneath. Thorax black with notauli not very deep; metanotal areola narrow and parallel-sided, but apically complete; petiolar area short and entire; costulae wanting. Scutellum black. Abdomen deplanate, nitidulous and bright red with basal segment, except sometimes in ♀, and the ♂ anus black; basal segment distinctly petiolate with carinae extending beyond its central spiracles; terebra distinctly exerted and reflexed. Legs black; anterior red with ♂ coxae and trochanters either flavous or black, hind tibiae except apically and tarsi testaceous, the latter sometimes with the third and fourth joints indefinitely whitish. Wings hyaline; radix and tegulae testaceous or stramineous; stigma more or less pale; areolet nearly always entire and basal nervure usually continuous. Length, 8—10 mm.

After considerable research I find I cannot regard *C. foveolator* or *C. montanus* as distinct from the present species; the former is erected as new by Holmgren on account of the narrower and deeper petiolar sulcus, presence of gastrocoeli on the second segment, apically darker stigma and white-banded ♀ hind tarsi; while the latter is said by him to differ from both in its posteriorly broader head, its lack of postocellar foveola and areolet, while the entirely pale ♂ face of both the former is black with only flavidous marks in *C. montanus*. Thomson considers the lower basal nervure antifurcal and ♂ face flavous in *C. foveolator*, but continuous with the ♂ facial orbits alone citrinous (= *M. Waltoni*, Curt.) in *C. fuscicornis*; I find the position of the basal nervure varies in the two wings of even a single example and facial marking are proverbially instable; moreover unlike Holmgren, Thomson gives *C. montanus* an entirely pale ♂ face. If there be three species, I should give *foveolator* the black-faced male,

A wide-spread species on umbelliferous flowers throughout northern Europe in June and July, the form *montanus* extending as far south as Austria. Brischke bred *foveolator* from cocoons of *Tenthredo punctulata* (Schr. Nat. Ges. Danz. 1878, p. 68) and from larvae of *Tenthredo scalaris* in Prussia (*lib. cit.* 1871, p. 67); a female *fuscicornis*, of which he thought *montanus* probably a variety, emerged from those of *T. punctulata* (*id.*). Of these three forms, *foveolator* has not before been noticed in Britain, but I have taken undoubted females on bracken at Matley Bog and Wilverley in the New Forest in both June and July, 1907 and 1909. The typical form is commoner with us, though local and occurring only in woods; I have seen it in Donovan's and Desvignes' collections; Shere in Surrey (Capron, Entom. 1880, p. 87), Felden in Herts in June, 1900 (Piffard), Guestling in Sussex in 1879 (Bloomfield), Dover, Devonshire and near London (Stephens), Kings Lynn in Norfolk (Bridgman), Govilon in south Wales (Marshall), and Plym Bridge, Devon, early in August (Bignell); I have found it at Knightwood, Wilverley and Denny Wood in the New Forest in 1907 on bracken with the above form, by sweeping at Ranworth in Norfolk in 1901, and at Brandon in Suffolk, always in the middle of June. The form *montanus* (= ? *Waltoni* with only ♂ orbits pale) seems rare and I possess the three males upon which Capron synonymises it (Trans. Ent. Soc. 1887, p. 370) with *C. fuscicornis*, together with a male from Tuddenham in the middle of June; Marshall took it at Govilon and Cornworthy, and there are three males with variable face but no areolet in Mus. Brit. ex coll. Desvignes, who relied upon this feature solely to distinguish it. Curtis says of his male "This insect is remarkable for its curious antennae, which resemble the vertebrae of some reptiles, and the areolet is [sometimes] exceedingly minute. Three specimens were taken by the river Nidd at Knaresborough in June, and also in the neighbourhood of Settle in Yorkshire"; Lulworth in Dorset (Dale, Lep. of Dorset, 77). *Mesoleptus mirabilis* is a very wonderful monstrosity of the present species from Coombe Wood in June; Stephens says "This extraordinary insect is singularly intermediate between the Ichneumonidae and Braconidae," on account of a spurious nervure, which in the left front wing is simply an elongate ramellus extending from the discoidal nervure four-fifths of the distance to base of the stigma, but in the right wing extends from a bifurcate base touching the stigma near its base hardly more than half way towards the evenly rounded discoidal nervure; the neurulation is otherwise normal.

EURYPROCTUS, Holmgren.

Holmgr. Sv. Ak. Handl. 1855, p. 109.

Head transverse and not buccate, though often broad and never strongly constricted behind the entire and oblong-ovate eyes; vertex emarginate; clypeus hardly discreted, with a subobsolete basal fovea on either side and the apical margin not depressed; mandibular teeth of equal, or very nearly equal, length. Antennae filiform, slender, as long or nearly as long as the body, with flagellum sometimes red and often centrally white-banded. Thorax somewhat stout, usually subdeplanate and dull with close sculpture; metanotal areola usually, but costulae rarely, entire. Scutellum always black. Abdomen nitidulous and smooth, of ♂ usually explanate apically; basal segment always distinctly petiolate

and a little curved dorso-ventrally; petiole always very distinct from post-petiole and usually parallel-sided to the subcentral and prominent spiracles; postpetiole dilated throughout, and often discally sulcate at its base; apical segment not emarginate; terebra slightly exerted and straight, though often deflexed. Legs with intermediate femora apically subattenuate, their tibiae a little curved, the hind tarsi often white-banded, and all the claws simple. Areolet inconstant, petiolate.

The distinct and usually parallel-sided petiole will at once distinguish this genus from *Mesoleius* and its allies, in which the basal segment is evenly explanate throughout from its base; here the segment is distinctly a little arcuate and not, as in *Mesoleptus*, straight.

I retain this genus exactly as it was at first erected by Holmgren, since it has more recently been broken up into a multiplicity of subgenera and named groups by Thomson in his three papers (O. É. ix. 926; xiii. 1429; xix. 1984). Such divisions of these as include those of our species which were originally placed here will be found in my table, but I am strongly of the opinion that their features are insufficient to constitute genera, except perhaps in the case of *Sychnoleter* and even here they lie more in superficial facies than structural characters. Pfankuch regards the kinds falling under *Ipoctonus*, Thoms., more correctly placed in *Phobetor*, Först., on account of the sparse metanotal carinae: I use Thomson's, not Förster's typeless, subgenera. *Syndipnus* would well repay a month's elucidation, which I have not found leisure to bestow upon it; there are many more forms than are here exhibited in Britain and these may prove to be good species.

Table of Species.

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|-------|-----|--|-----------------------|
| (18). | 1. | Basal segment evenly sculptured; petiole elongate and very slender. | |
| (11). | 2. | Metanotum bicarinate; postpetiole often strongly, abruptly dilated. | |
| (10). | 3. | Metanotal costulae wanting; postpetiole bicarinate or not sulcate [EURYPROCTUS]. | |
| (9). | 4. | Antennae and hind tarsi broadly white-banded; areola entire. | |
| (6). | 5. | Abdomen and hind tibiae entirely black | 1. ANNULATUS, Grav. |
| (5). | 6. | Abdomen and hind tibiae very broadly red. | |
| (8). | 7. | Areolet entire; face black; metanotum dull | 2. NEMORALIS, Fourc. |
| (7). | 8. | Areolet wanting; face flavous; metanotum shining | 3. ALPINUS, Holmgr. |
| (4). | 9. | Antennae and hind tarsi not banded; areola incomplete | 4. MUNDUS, Grav. |
| (3). | 10. | Metanotal costulae entire; postpetiole simply sulcate [SYCHNOLETER] | 5. GENICULOSUS, Grav. |
| (2). | 11. | Metanotum not or hardly carinate; postpetiole slightly dilated. | |
| (13). | 12. | Basal petiolar scrobes distinct; antennae white-banded [HIMERTUS] | 6. DEFECTIVUS, Grav. |
| (12). | 13. | Basal petiolar scrobes wanting; antennae not pale-banded [IPOCTONUS]. | |

- (17). 14. Thorax black; size at most eight millimetres.
- (16). 15. Abdomen and legs fulvous; anus at most subinfusate 7. *ATOMATOR*, Müll.
- (15). 16. Abdomen and hind legs apically infusate; anus black 8. *CHRYSOSTOMUS*, Grav.
- (14). 17. Whole body testaceous; size at least twelve millimetres 9. *NIGRICEPS*, Grav.
- (1). 18. Basal segment rugulose; petiole short, stout and explanate [*SYNDIPNUS*].
- (26). 19. Nervellus postfurcal, intercepted at or below its centre.
- (25). 20. Interception of nervellus only slightly below centre.
- (22). 21. Metanotal costulae entire; postpetiole not sulcate 10. *MINUTUS*, Bridg.
- (21). 22. Metanotal costulae wanting; postpetiole sulcate.
- (24). 23. Face mainly white; metanotal areola obsolete 11. *ALBOPICTUS*, Grav.
- (23). 24. Face centrally white-dotted; areola very distinct 12. *XANTHOSTOMUS*, Grav.
- (20). 25. Interception of nervellus very far below centre 13. *NOTATUS*, Grav.
- (19). 26. Nervellus antefurcal, intercepted a little above its centre 14. *LATERALIS*, Grav.

1. *annulatus*, Grav.

Mesoleptus annulatus, Gr. I. E. ii. 11, ♀. *M. annulator*, Ste. Ill. M. vii. 223, ♀. *Euryproctus annulatus*, Holmgr. Sv. Ak. Handl. 1855, p. 109, ♀; Brisch. Schr. Nat. Ges. Danz. 1871, p. 68, ♂; Kriech. Ent. Nachr. 1891, p. 40, ♂ ♀; Thoms. O. E. xix. 1885.

A black and deplanate species, with only tarsi and flagellum pure white-banded. Head transverse and a little constricted posteriorly, somewhat dull; vertex centrally emarginate; clypeus short, apically rounded, strongly and sparsely punctate; palpi black, mandibles sometimes piceous. Antennae filiform, slender and apically subattenuate, black, at least in ♀ with the twelfth to seventeenth joints white, and the apex beneath testaceous. Thorax immaculate black and finely punctate; metanotum discally bicarinate, with petiolar area small and entire. Abdomen deplanate, nitidulous and entirely black; basal segment petiolate and very smooth; terebra slightly exerted. Legs slender and black with the front tibiae and often apices of their femora red; intermediate tibiae more or less broadly ferrugineous; front tarsi dark red, and the posterior with second to fourth joints white. Wings somewhat clouded with the stigma, radius, radix and tegulae infusate; the areolet irregularly triangular and sessile, externally pellucid below and subcontinuous with the broadly unifenestrate recurrent nervure; nervellus opposite. Length, 11 mm.

Stephens' type, in Mus. Brit., is a somewhat pale ♀ of the present species from which it differs only in having the palpi white, the anterior femora more broadly testaceous and the second to fourth segments very darkly and indefinitely badious; the venation and thoracic conformation are entirely normal, with areolet not petiolate; the hind legs are wanting.

This species would appear very scarce in Britain and there are no records since its introduction by Desvignes in 1856 on the strength of the three unlocalised females in his collection, now in Mus. Brit. Abroad it is recorded from Silesia (Grav.), Sweden (Holmgren), Prussia (Brischke), Belgium (Gosq.), Switzerland (Kriech.) and France (Gaulle). With us it would appear confined to the south of England and I have only seen five females, three kindly given me by Miss Chawner from the New Forest, where she probably bred them from some Tenthredinid, one taken by Stanley Edwards during 1890 at Lynton in Devon, where Bignell did not meet with it, and another captured on the wing by Lyle on 29th September, 1910, about Brockenhurst.

2. *nemoralis*, Fourc.

Ichneumon nemoralis, Fourc. E. P. ii, 1785, 416; Gr. Mem. Ac. Sc. Tor. 1820, p. 363, ♂. *Mesoleptus nemoralis*, Gr. I. E. ii. 70, excl. ♂; Ste. Ill. M. vii. 222, ♀. *Euryproctus nemoralis*, Holmgr. Sv. Ak. Handl. 1855, p. 110, ♂ ♀; Thoms. O. E. xiii. 1434; L.c. xix. 1985. *E. tuberculatus*, Holm. Sv. Ak. Hdl. 1855, p. 111, ♀. Var. *M. suborbitalis*, Ste. Ill. M. vii. 222. Var. *E. crassicornis*, Thoms. O. E. xiii. 1433, ♂ ♀. Var. *Cryptus regenerator*, Fab. Piez. 1804, 83, ♀; *Ichneumon regenerator*, Thunb. Bull. Ac. Petersb. 1822, p. 257; Trentep. Isis, 1829, p. 945, ♀; *Mesoleptus regenerator*, Gr. I. E. 75, excl. var.; Ste. Ill. M. vii. 224; *Euryproctus regenerator*, Holmgr. Sv. Ak. Handl. 1855, p. 111, ♂ ♀.

A somewhat shining and very finely punctulate species, with abdomen centrally red and both antennae and hind tarsi white-banded in both sexes. Head transverse, not constricted posteriorly and entirely black, or with ♂ clypeus rarely pale; face hardly protuberant; clypeus short, apically broadly rounded and sparsely punctate. Antennae centrally white-banded in both sexes, and with flagellum rufescent beneath both basally and apically. Thorax dull, evenly sculptured; metanotal areae distinct but costulae wanting. Abdomen broadly red centrally; basal segment slightly arcuate, with usually prominent spiracles and the post-petiole gradually explanate apically, thrice broader than the long petiole; both terebra and ♂ valvulae exerted. Legs with the tarsi, tibiae and at least anterior femora red; hind tibiae apically black and the tarsi white-banded in both sexes; tibiae distinctly spinulose. Wings with the dark stigma basally paler, areolet subpetiolate and triangular; lower basal nerve continuous or subpostfurcal; nervellus intercepted above its centre. Length, 7—9½ mm.

At once known by the white-banded antennae and hind tarsi in both sexes, combined with the centrally broadly red abdomen, very distinct areolet and strong central metanotal area. It is said to differ from *E. crassicornis*, Thoms., in its more slender antennae, dark palpi and not antefurcal basal nerve; Elliott took several examples, comprising both sexes of this form, which I cannot consider distinct, at Banchory in Kincardine during September, 1910. I know nothing of *M. suborbitalis*, the type of which I fail to find in Stephens' collection.

The type form is not infrequent in southern Sweden, Germany, Belgium and France in June; and Brischke says (Schr. Nat. Ges. Danz. 1878, p. 69) that he bred a variety from the cocoons of *Tenthredo scalaris* in Prussia. Stephens thought it somewhat common about London and in Shropshire in June, but the only specimen in his collection was representing the undescribed female of *Mesoleptus arridens*, Grav. It is, however, not very uncommon with us, though said to be rare when

exhibited from Oxshott in July, 1893 (Meeting S. Lond. Ent. Soc., March 8th, 1894); Lands End (Marquand); Boxhill early in August, 1898 (Beaumont); several at Shere (Capron); Barr in Ayrshire, during the latter half of July, 1899 (Dalglish). I took several about Ipswich in 1894, but did not again meet with it till 1905, when a male occurred upon *Angelica sylvestris* flower at Barton Mills, Suffolk, at the end of August. It appears impossible to separate *E. regenerator* from the typical form of this species upon any grounds but its mainly red hind femora, both basally and apically black in Grav.'s example and castaneous in one or two of my own; both Holmgren and Thomson failed to detect further distinctions; its distribution seems co-extensive, and Brischke has bred it (Schr. Nat. Ges. Danz. 1871, p. 68) from the same host. I have seen two British females in Mus. Brit.

3. *alpinus*, Holmgr.

Euryproctus alpinus, Holmgr. Sv. Ak. Handl. 1855, p. 110, ♂.

Somewhat shining and finely punctate, with body mainly red. Head hardly constricted posteriorly; mouth, clypeus and the face, except a central longitudinal line and another across base of clypeus, flavous. Antennae filiform and tricoloured; scape flavous beneath; flagellum broadly rufescent and centrally white-banded. Thorax immaculate; metanotum nitidulous with areae distinct, though costulae wanting; areola not very narrow, apically incomplete. Abdomen centrally broadly red; basal segment slightly arcuate, with postpetiole gradually explanate apically, and thrice breadth of petiole; valvulae exerted. Legs black with the tarsi, tibiae and most of the anterior femora, red; hind tibiae apically black; hind tarsi centrally white-banded. Wings normal; areolet wanting; nervellus intercepted above its centre. Length, 9 mm. ♂ only.

Very like *E. nemoralis*, but differing in its capital colouration, metathoracic structure, wanting areolet and more shining metanotum. It was thought by Thomson (O. E. xiii. 1435) to probably be synonymous with *E. albipes*, Holmgr., but since he here erroneously also synonymised *E. tuberculatus*, Holmgr., we are justified as considering it at least temporarily as distinct.

I regard this species as doubtful, both in respect of its distinction from *E. nemoralis* which is slight and secondly as truly indigenous, since it entirely rests upon a ♂ correctly here placed by Desvignes in his own collection, now in Mus. Brit. It has only been found in Belgium and France since Holmgren first recorded it from Tärna in southern Sweden on 1st August.

4. *mundus*, Grav.

Ichneumon mundus, Gr. Mem. Ac. Sc. Torin. 1820, p. 367, ♂ ♀. *Mesoleptus mundus*, Gr. I. E. ii. 78; Ste. Ill. M. vii. 224, ♂ ♀; Holmgr. Sv. Ak. Handl. 1854, p. 65, ♂. *Euryproctus mundus*, Holmgr. l.c. 1855, p. 111, ♀; Thoms. O. E. ix. 926; l.c. xiii. 1436, ♂ ♀. Var. *E. bivinctus*, Holmgr. Sv. Ak. Handl. 1855, p. 113, ♂.

Head dull and a little constricted posteriorly; palpi often stramineous, mandibles usually centrally fulvous; frons slightly impressed on either side, face subdeplanate, cheeks narrow. Antennae not white-banded; of ♂ infuscate, rufescent below with scape usually black; of ♀ fulvous and

more or less infusate, with the scape black, above. Thorax dull, with notauli obsolete; mesopleurae not nitidulous; metanotum rugulose and dull, with no distinct areae or with the areola roughly indicated; petiolar area basally incomplate. Scutellum not convex. Abdomen nitidulous, deplanate and black, with segments two to four and apex of ♀ postpetiole bright red; basal segment with elongate petiole, postpetiole gradually dilated and thrice breadth of petiole; terebra slightly exerted. Legs black with the anterior tarsi, tibiae and apices of femora, hind tibiae more or less broadly basally and sometimes hind tarsi red, but the last not white-banded. Wings slightly clouded; radius and tegulae, ♂ stigma and ♀ radix, infusate; ♀ stigma testaceous and ♂ radix flavescens; areolet subirregular and petiolate, externally a little convex; nervellus intercepted above its centre and strongly postfurcal. Length. 7—9 mm.

Superficially not unlike *Cataglyphus fuscicornis*; distinct from other species of its genus in the dull mesopleurae, obsolete metanotal carinae, basally incomplete petiolar area, in the unbanded antennae and tarsi, and in the short and dorsally deplanate ♂ ventral valvulae. Pfankuch says the black-faced type form has nitidulous speculum and considers *E. bivinctus* distinct in its pale-marked face (= var. ♀, Thoms. O. E. xix. 1436) and dull speculum; but Thomson and I do not follow him.

It occurs in central Europe and Italy in June and at the end of May on umbelliferous flowers, but is rare in Sweden. I have not taken this species, and possess but two females in Capron's collection from Shere in Surrey. The Mus. Brit. contains a ♂ taken by Stephens "in June near London, and in Devonshire and Salop," another male ex coll. Linn. Soc. Lond. named by Gravenhurst himself, and half-a-dozen other examples from Botusfleming, etc. Marshall took the var. *bivinctus* at Nunton in Wiltshire, and I have a pair, of which the male is from Capron's collection and the female from the New Forest, found by Miss Chawner. Stephens' representative of *M. arridens*, Gr., is a male of the present species.

5. geniculosus, Grav.

Mesoleptus geniculosus, Gr. I. E. ii. 102; cf. i. 686; Ste. Ill. M. vii. 229, ♂. Holmgr. Sv. Ak. Handl. 1854, p. 66, ♂ ♀. *Euryproctus geniculatus* (sic), Holmgr. l.c. 1855, p. 114, ♂ ♀. *E. geniculosus*, Brisch. Schr. Phys. Ges. König. 1871, p. 68. *Sychnoleter geniculosus*, Thoms. O. E. xiii. 1430.

A black and somewhat slender species, with abdomen and legs mainly bright red. Head not posteriorly constricted, vertex somewhat broad and frons coriaceous; face with griseous pilosity; mandibles, except apically, and clypeus flavidous. Antennae very slender, not shorter than body and entirely red, with scape alone black above. Thorax immaculate and somewhat dull, with distinct notauli; metathorax coarsely but not deeply or closely punctate, subnitidulous with strong and complete areae; areola subhexagonal, half as long again as broad, emitting sometimes obsolete costulae before its centre; petiolar area strong and distinctly discreted laterally. Scutellum black and closely punctate. Abdomen fusiform, red and very nitidulous with the petiole and fifth segment to apex alone black; basal segment elongate and slightly curved throughout, basally petiolate, parallel-sided to the prominent central spiracles and thence not strongly explanate to apex, which is hardly double breadth of petiole, with discal sulcus but no carinae; hypopygium extending to anus and

covering base of the somewhat exserted, straight, red, and apically very obtuse terebra. Legs red, with all the trochanters and anterior coxae flavous; all the onychii, with apices of the hind tibiae and femora conspicuously, and usually extreme base of hind coxae, black. Wings hyaline and not large; stigma piceous, basally paler; radix and tegulae stramineous; areolet entire, triangular and petiolate; nervellus postfurcal and intercepted distinctly a little above its centre. Length, 10 mm.

Unmistakable in its clear red antennae, abdomen and legs with the apices of the hind femora and tibiae conspicuously and determinately black. The areolet is often minute.

This species is recorded from Germany, Sweden, Belgium and Prussia; Cameron says it preys on *Selandria Sivi* and Gaulle tells us it has been bred from *Selandria serva* in France. Hope first sent both sexes to Gravenhorst from Netley in Shropshire, as recorded in 1829; Stephens found it about London in June and July, and there are three from his collection in Mus. Brit., with one named by Grav. ex coll. Linn. Soc. Lond. With us I believe it to be a common species only in the most marshy localities; I have always regarded it as common from an early intimate acquaintance, when I first studied the Ichneumonidae in 1898, for it occurred to me commonly throughout the August of that year at Oulton Broad in Suffolk, where Bedwell has subsequently found it, from 5th July to September. Elsewhere it would seem scarce; Heigham and Brundall in Norfolk, in July and August (Bridgman); Lasingham, in Yorks (Marshall); I possess it from Bickleigh 23rd September, 1887 (Bignell); Guestling in Sussex in 1880 (Bloomfield); Lyndhurst in New Forest, 20th September (Adams); and Possil Marsh, near Glasgow in August, 1899 (Dalglish).

6. *defectivus*, Grav.

Ichneumon defectivus, Gr. Mem. Ac. Sc. Torin. 1820, p. 366, ♀. *Mesoleptus defectivus*, Gr. I. E. ii. 77; Ste. Ill. M. vii. 224, ♀; Holmgr. Sv. Ak. Handl. 1854, p. 65, ♂. *Euryproctus defectivus*, Holmgr. l.c. 1855, p. 112, ♂; Woldst. Bidr. Finl. Nat. 1872, p. 36, ♀; Kriech. Term. Füz. 1895, p. 130, ♂ ♀. Var. *Tryphon varicornis*, Gr. I. E. ii. 325; Fonsc. Ann. Soc. Fr. 1849, p. 233, ♀; *E. varicornis*, Thoms. O. E. ix. 927, ♂ ♀. Var. *E. bisannulatus*, Thoms. O. E. ix. 927; *Himertus bisannulatus*, Thoms. O. E. xix. 1985, ♂ ♀.

Somewhat shining, punctate and stout. Head transverse, slightly narrowed posteriorly; frons deplanate, dull, closely punctate; face distinctly punctate and not prominent; clypeus apically depressed, subtruncate and somewhat smooth. Antennae subsetaceous and hardly shorter than the body with joints 13—15 white; flagellum of ♂ 42-jointed. Thorax as broad as head; mesonotum convex, punctate, with notauli and black pilosity; metathorax not apically constricted, rugulose with no discal areae. Scutellum subconvex. Abdomen as long and broad as head and thorax, deplanate and petiolate; basal segment stout, smooth and black, gradually explanate apically, double breadth of petiole, with central spiracles; second to fourth rufescent-castaneous, with apex of fourth nigrescent and remainder black; terebra shortly exserted. Legs elongate and not slender; anterior red, with coxae and trochanters black; hind ones black, with the femora and tibiae basally or except apically red, and the tarsi (when fresh) with joints two to four pure white. Wings distinctly flavescent; stigma and radius piceous, radix and tegulae black;

areolet wanting, recurrent emitted some distance beyond submarginal nervure; radius apically straight; nervellus intercepted a little above centre. Length, 9—11 mm.

Grav. says the ♀ is more slender than that of *E. nemoralis*, while British examples are stout (robustus, Holmgr.) and large, though, as he adds, the areolet is wanting and the basal segment less dilated apically with the petiole shorter and stouter. Pfankuch says Holmgren's description agrees with the type, and that both *varicornis* and *bisannulatus* are co-specific with it. The var. *varicornis* appears to mainly differ in having the 4th to 12th antennal joints rufescent; they are black in all Britishers I have seen. The var. *bisannulatus* has the recurrent nervure nearly continuous with the submarginal; Thomson did not recognise *E. defectivus* at all.

Very rare at beginning of August in Sweden (Holmgr.); a pair from Piedmont in Italy (Gr. teste Pfank.); early in Sept. at Aix and Lyons in France (Fonsc.); Germany and Belgium. There are a couple in Mus. Brit., of which one was "found in June at Darent wood" by Stephens. Mr. Dalglish has given me one with red femora from Blair Moor near Glasgow during June, 1899; and I have taken a couple of males in the New Forest on 23rd and 24th August, 1901, in a Lyndhurst garden and by sweeping *Mentha hirsuta* at Philips Hill. *E. varicornis* was introduced by Bridgman (Tr. Ent. Soc. 1886, p. 357) on the strength of a male he found at Wimbledon in July, 1881; he says the head is less oblique posteriorly and the basal segment broader than in the type form, with base of hind femora red.

7. atomator, Müll.

Ichneumon atomator, Müll. Prodr. 1776, 158. *Mesoleptus atomator*, Gr. I. E. ii. 92, ♂ ♀. *Euryproctus atomator*, Holmgr. Sv. Ak. 1855, p. 114, ♂; Brisch. Schr. Nat. Ges. Danz. 1878, p. 70, ♂ ♀. *Ipoctonus abominator* (sic), Thoms. O. E. xiii. 1432. *I. atomator*, Thoms. O. E. xix. 1987.

A shining and finely punctulate species, with legs and abdomen entirely testaceous. Head not constricted posteriorly; mouth and clypeus testaceous or flavous; clypeus apically broadly rounded and not impressed. Antennae subtestaceous, nearly as long as the body, infusate with the underside entirely in ♀, or only scape in ♂, testaceous. Thorax black, with the metanotal areae incomplete. Abdomen as broad as thorax, oblong-ovate, fulvous; basal segment subscabrous, discally sulcate, somewhat impressed beyond the central spiracles, apically dilated with the petiole not parallel-sided and in ♂ sometimes infusate; terebra hardly exerted, testaceous; ♂ anus often narrowly black. Legs entirely flavidous. Wings normal, slightly clouded; stigma and radius infusate, radix and tegulae flavescent; areolet wanting, or extremely obsolete and irregular; nervellus intercepted hardly below its centre. Length, 6—8 mm.

Instantly known by the entirely testaceous abdomen and legs in the present genus, though very strongly resembling *Perilissus lutescens*, Holmgr.

It occurs in Germany as late as October, is found in Sweden and throughout central Europe. With us it is most common in marshy places, but no one has yet bred it; I suggest its host to be the *Doleri* that feed in *Juncus* stems. Claygate in Surrey in 1877 (Champion); a

full series from Shere (Capron); Bristol in June, 1897 (Beaumont); Lynmouth in July, 1902 (Charbonnier); Horrbridge in Devon during September (Bignell); Botusfleming in Cornwall, one (Marshall); several in coll. Desvignes, probably from Essex; Finborough Park in Suffolk on *Angelica sylvestris* flowers in September, 1900 (Tuck); Norwich, Brundal and Buckenham Ferry in Norfolk, in June and October (Bridgman); Lyndhurst in July, 1907, (Adams).

8. *chrysostomus*, Grav.

Ichneumon chrysostomus, Gr. Mem. Ac. Sc. Torin. 1820, p. 120, ♀. *Mesoleptus chrysostomus*, Gr. I. E. ii. 103, ♀. *Euryproctus chrysostomus*, Holmgr. Sv. Ak. Handl. 1856, p. 377, ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 70, ♂ ♀. *Ipoctonus chrysostomus*, Thoms. O. E. xiii. 1432 et xix. 1987, ♂ ♀.

A shining and finely punctulate species with abdomen, except apically, red. Head subbuccate and constricted posteriorly; clypeus and mouth, except apices of mandibles, flavous; face with griseous pilosity; clypeus arcuately discreted, deplanate and apically rounded. Antennae infusate with scape flavous beneath, of ♀ shorter than body. Thorax black and narrower than head, notauli distinct, pleurae sparsely punctate; metanotal areae incomplete, areola narrow and apically wanting. Postscutellum sometimes ferrugineous. Abdomen as broad and long as head and thorax, oblong-ovate or in ♀ pyriform; deplanate and red with anus from about centre of fourth segment black; first segment basally constricted, somewhat distinctly sulcate centrally and not impressed beyond the central spiracles; petiole parallel-sided and in ♂ sometimes black, postpetiole abruptly explanate; anus dilated, terebra short and infusate. Legs slender and pale red with anterior coxae paler; hind tibiae and tarsi, or whole of the latter, subinfusate. Wings slightly clouded with stigma and radius infusate, radix and tegulae flavous; areolet wanting; nervellus intercepted below centre. Length, 6—7 mm.

One of the smallest of the genus, known by its subconvex body, distinct longitudinal metanotal carinae, red abdomen and coxae with anus alone black and petiolar sulcus distinct, the red legs with only the hind tibiae apically above and claws black. Pfankuch says the type is lost.

It occurs in marshy places about the middle of August in Sweden; Germany, Italy, France and Belgium. Brischke bred (Schr. Nat. Ges. Danz. 1871, p. 68) a ♀ from larvae of *Tenthredo (Taxonus) agilis* in Prussia where he found, with the males, females with entirely and partly red thoraces. I cannot say that I am satisfied that the ♂ here placed by Desvignes in his collection, upon which all our records are based, really represents this species, which I do not know. Mr. J. N. Halbert gave me an analogous male, swept from reeds at Lake Namocka in Mayo, when I was there with him in July, 1910.

9. *nigriceps*, Grav.

Tryphon nigriceps, Gr. I. E. ii. 202; Ratz. Ichn. d. Forst. i. 126, ♂; Curt. Trans. Ent. Soc. 1853, Proc. p. cxxxvi. *Euryproctus nigriceps*, Holmgr. Sv. Ak. Handl. 1855, p. 113; Brisch. Schr. Phys. Ges. König. 1871, p. 68; Schr. Nat. Ges. Danz. 1878, p. 69, ♂ ♀. *Mesoleptus praetermissus*, Woldst. Bidr. Kaen. Finl. Nat. 1872, p. 30, ♂ ♀. *Ipoctonus nigriceps*, Thoms. O. E. xiii. 1432, ♂ ♀.

A large, brick-red species with only the head, except mouth and clypeus, and sometimes anus black. Head hardly constricted posteriorly; vertex

somewhat broad. Flagellar joints apically subnodulose. Metathorax dull with no distinct areae, areola cariniform or obsolete, lateral carinae entire and spiracles circular. Abdomen stout; basal segment stout, narrow and subdepressed beyond the prominent and subcentral spiracles, Tarsal claws nearly straight and not pectinate. Areolet wanting; nervellus subopposite and intercepted slightly below its centre. Length, 12—16 mm.

A most conspicuous insect in its large size, pale colour and stout structure.

It has been found in France, Hercynia in June, Prussia, Sweden and western Russia; it has been constantly bred from the large Cimbicid sawflies, first by Ratzeburg in the Hartz Mountains from *Cimbex Sorbi*, considered to be *C. lucorum* by Holmgren and *Trichiosoma betuleti* by Dalla Torre; next from larvae and the cocoons of *Clavellaria amerinae* by



Giraud and Brischke, who describes its cocoon as "cylindrisch, dünnhäutig, braun, aussen etwas wollig"; and to these Gaulle adds *Trichiosoma vitellinae*. In Britain it is by no means common, and hardly ever taken at large; Bignell bred it on 11th June, 1881, from *Trichiosoma betuleti* cocoon (Entom. 1885, p. 152; the genus is erroneously printed *Blennocampa* at Trans. Devon. Assoc. 1898, p. 235, copied by D. T. and Gaulle); four were bred at York from cocoons of the same species in 1880 (Wilson, Yorks. Nat. 1881, p. 153) and fourteen from the same host, found during the winter, emerged 1881 (Trans. Yorks. Nat. Union, 1882, p. 106); Norwich, several bred from this host, but not otherwise seen (Bridgman); a female from Rannoch (Gibbs). I possess some half-dozen, taken or bred

at Knowle, near Birmingham (W. Ellis); from the London District (ex coll. J. A. Clark); and from Shere (Capron). It was first bred here by Foxcroft from cocoons of *T. lucorum* in Wales.

10. *minutus*, Bridg.

Euryproctus minutus, Bridg. Trans. Ent. Soc. 1886, p. 358. ♂.

A small black species with abdomen partly red, face and front coxae flavous. Head transverse, slightly broader than thorax, not constricted posteriorly; mouth, cheeks, and except a central line, face flavous. Antennae as long as body. Thorax punctate with a dot before and line beneath radices, with mesopleural sutures, flavous; notauli distinct, extending beyond mesonotal centre; metanotum finely rugose, with five distinct areae and costulae entire; areola basally convergent, apically incomplete and continuous with petiolar area. Abdomen slightly longer than head and thorax, red with the first segment black, a discal mark on second with more or less of fourth and whole of remainder, except pale apex, nigrescent; basal segment petiolate and not discally sulcate, with distinct spiracles a little before its centre; petiole parallel-sided, twice and a half longer than broad; postpetiole apically explanate and thrice broader apically than basally, with its apical breadth hardly half that of its total length. Legs normal and red, with intermediate femora darker below; front coxae and most of their trochanters flavous; hind legs black with tibiae, except apically, red. Wings with tegulae flavous, stigma infusate; areolet wanting, radius apically nearly straight; nervellus intercepted at or but slightly below centre. Length, 5 mm. ♂ only.

Evidently very closely allied to *E. notatus*, though with the nervellus intercepted but slightly below its centre, the basal segment with petiole parallel-sided and no discal sulcus, the costulae entire and both face and thorax pale-marked. Bridgman's variety ♂ appears distinct to me.

Two males were captured by its author in May, 1882, at Brundall near Norwich; they are doubtless preserved in his collection at the Norwich Castle Museum.

11. *albopictus*, Grav.

Tryphon albopictus, Gr. I. E. ii. 255, ♂. *Euryproctus albopictus*, Holmgr. Sv. Ak. Handl. 1855, p. 114, ♂; 1856, p. 378, ♀. *Mesoleius transfuga*, Holmgr. lib. cit. p. 164, ♂ ♀. *Euryproctus transfuga*, Thoms. O. E. ix. 928; *Syndipnus transfuga*, Thoms. O. E. xix. 2008, ♂ ♀.

A shining, punctulate species, with hind tibiae mainly white and abdomen more or less broadly red centrally. Head somewhat constricted posteriorly; mouth, clypeus and, except a black line connecting it with clypeus, face whitish; clypeus apically broadly rounded, hardly margined and basally subdiscreted; cheeks black and not buccate. Antennae filiform, as long as body and more slender in ♂; scape whitish beneath; five or more basal flagellar joints whitish-testaceous, becoming apically darker. Thorax white-dotted below radices; mesonotum convex with indistinct notauli, pleurae nitidulous; metathorax subrugulose with areola wanting or very incomplete, petiolar area smooth and entire. Abdomen nitidulous, apically explanate in ♂ and subcompressed in ♀, black; ♂ with second segment except two discal dots, third entirely and

a transfascia on fourth, red or with only the second segment apically ferrugineous in both sexes; remainder apically flavescent-margined; basal segment very slightly curved and subdistinctly sulcate discally to beyond its centre, with central spiracles; ventral plica flavous, hypopygium extending to sixth dorsal segment; terebra short and infusate. Legs fulvous; anterior with coxae and trochanters of ♂ whitish; hind coxae black and in ♂ apically, with trochanters, whitish; hind tibiae in both sexes whitish with apices, apices of their femora, and all their tarsi, nigrescent. Wings hyaline, stigma and radius infusate, radix and tegulae white; areolet wanting or irregularly subpetiolate; nervellus intercepted a little below centre. Length, 6 mm.

Holmgren thought his ♂ intermediate between *Euryproctus* and *Mesoleius*, on account of the gradually explanate petiole and basal coarctation. Pfankuch tells us *M. transfuga* is synonymous with *T. albopictus*, though Holmgren's descriptions of the two differ in many essential features, and they are not amalgamated by Gaulle in 1908.

This collective species occurs in Silesia, Belgium, France, and from the end of July to early September in southern Sweden; it was bred by Brischke (Schr. Nat. Ges. Danz. 1871, p. 80) from larvae of *Nematus hypogastricus* and of *N. testaceus* in Prussia. *E. albopictus* was recorded by Marquand from the Lands End district (Trans. Penzance Nat. Hist. Soc. 1884, p. 346); and by Bridgman from Brundall in Norfolk during July and August. *M. transfuga* was also brought forward by the latter with some hesitation (Trans. Norf. Soc. 1894, p. 625) from Kings Lynn in the same county and bred, probably at Worcester, from *Camponiscus luridiventris* by Fletcher.

12. xanthostomus, Grav.

Tryphon xanthostomus, Gr. I. E. ii. 257; Ste. III. M. vii. 254, ♀. *Mesoleius xanthostomus*, Brisch. Schr. Phys. Ges. König. 1871, p. 82, ♂ ♀. *Euryproctus xanthostomus*, Thoms. O. E. ix. 927; *Syndipnus xanthostomus*, Thoms. O. E. xix. 2000, ♂ ♀. *Mesoleptus rufocinctus*, Gr. I. E. i, Suppl. 686; Ste. III. M. vii. 229, ♀. *E. hilarellus*, Holmgr. Sv. Ak. Handl. 1856, p. 377, ♀.

A small species, black with the abdomen centrally red, the hind tibiae mainly and face centrally flavidous. Head hardly constricted posteriorly; mouth, clypeus and a circular or bifurcate facial mark flavous; clypeus short, subtruncate and often basally black. Antennae hardly shorter than body, filiform and apically subattenuate, with the four basal joints black and following red, becoming paler apically below. Thorax narrower than head, black and nitidulous; areola narrow and very distinct, petiolar area crescentic and complete. Scutellum convex. Abdomen subpetiolate, as long as head and thorax, oblong and in ♂ apically explanate; black with segments two to four and apex of the first red, the remainder apically pale-margined and venter flavidous; basal segment slightly curved, gradually explanate from apex of the parallel-sided petiole, fully twice longer than apically broad and discally sulcate to beyond its centre, with spiracles a little before its centre. Legs somewhat slender, red with tibiae flavescent in front; coxae and hind tarsi black, trochanters concolorous with apices flavous; hind tibiae, except apically, flavidous. Wings slightly clouded, stigma except at its pale base and radius infusate, radix and tegulae stramineous; areolet entire, petiolate and irregular; nervellus intercepted below centre. Length, 5—7 mm.

The facial colouration, smoother metathorax, more parallel-sided areola, flavescent tibiae and distinct areolet render it distinct from *E. notatus*, its lack of costulae from *E. minutus* and the position of the nervellus from *E. lateralis*. The form *M. rufocinctus* differs, says Pfankuch, in having the abdomen black with only the third segment discally pale castaneous.

It is said to occur in July and August at Breslau, in Silesia, and to have been taken by Hope about Netley (Grav.); very rare in Sweden during July (Holmgr.). It is nearly certain that Stephens' records of this species (*l.c.* 229 et 254) from London, Norfolk and the New Forest are incorrect, since it is not represented in his collection, and the only example known to me as British is a ♀ in Desvignes' collection in Mus. Brit., upon the strength of which (and two others erroneously placed with it) Marshall retained it in 1872 under both the genera *Mesoleptus* and *Tryphon*.

13. *notatus*, Grav.

Tryphon notatus, Gr. I. E. ii. 261, *cf.* i. 690; Ste. Ill. M. vii. 254, ♂ ♀. *Euryproctus notatus*, Brisch. Schr. Nat. Ges. Danz. 1871, p. 68, ♂ ♀; *cf.* Tr. Ent. Soc. 1882, p. 158. *Tryphon assimilis*, Holmgr. Sv. Ak. Handl. 1856, p. 384, ♂ ♀. *Syndipnus assimilis*, Thoms. O. E. ix. 928; *Synodytes assimilis*, Thoms. O. E. xix. 2002, ♂ ♀. Var. *Euryproctus sinister*, Brisch. Schr. Nat. Ges. Danz. 1871, p. 68; *lib. cit.* 1878, p. 70, ♀; Bridg. Trans. Ent. Soc. 1886, p. 357, ♂ ♀. *Tryphon bimaculatus*, Desv. Cat. 43, ♂.

Head not posteriorly constricted, with mouth and more or less of clypeus alone flavescent; mandibular teeth nigrescent and of equal length; cheeks elongate. Antennae filiform, hardly shorter than body, infusate or ferrugineous and darker above. Thorax immaculate black; metanotum scabrous with areola small and triangular; petiolar area entire and crescentic. Abdomen subpetiolate, as broad as head and thorax, oblong-ovate; black with 2nd and 3rd segments red, almost always more or less broadly binotated or transfasciated with black; the 4th often more or less red-marked and the 5th to 7th always apically flavidous; basal segment with distinct spiracles a little before its centre, its base not very slender, gradually dilated apically and only twice longer than apically broad, centrally distinctly sulcate and bicarinate to beyond its centre; ventral plica flavous; terebra black and very shortly exerted. Legs normal, red; coxae and trochanters black, with anterior usually ferrugineous beneath; hind tarsi rarely infusate. Wings subhyaline, stigma and radius infusate, radix and tegulae pale stramineous; areolet wanting; radius apically straight; nervellus distinctly antefurcal and intercepted considerably below its centre. Length, 5—7 mm.

This is by no means easy to recognise, as is indicated under the next species, and I was mainly able to do so by an examination of Desvignes' examples in Mus. Brit., where also are those taken not uncommonly about London in July by Stephens; but Hope's female from Netley in Shropshire is probably at Oxford and was named by Gravenhorst, who tells us that it occurs on umbelliferous flowers in July and August in Hungary, Austria and Germany, whence its range extends over most of Europe. I find no subsequent British records, but the species is quite one of our commonest and I possess it from Tostock during June and September, 1900 (Tuck); near Plymouth (Bignell); Kingsdown near Dover in July, 1898 (Sladen); Botusfleming, Bishops Teignton, Lastingham in Yorks

and Nunton in Wilts (Marshall); Lyndhurst (Adams); and Felden in Herts (Piffard). My series of forty was taken for the most part on flowers of *Chacrophyllum*, *Heracleum sphondylium*, *Angelica sylvestris* and *Foeniculum vulgare*, though occasionally by sweeping rough grass and mixed herbage. My first and earliest acquaintance with the species was at Belstead in Suffolk on June 1st, 1897, and from that date it occurs pretty regularly through July and August, up to the first week in September. I have found it at Cromer in Norfolk, Peterboro on the banks of the Nene in Northants, and in Suffolk at Ipswich, Stanstead Wood, Tuddenham Fen, Covehithe, Bramford, Barnby Broad, Alderton, Barking, Brandon by sweeping reeds, Barton Mills and constantly about the end of August here at Monks' Soham. I cannot consider *E. sinister* as more than a variety of the present species, with which it agrees in having the nervellus intercepted below the centre and with the next in (says Bridgman, who does not appear to have known *E. lateralis*) the flavous ♂ face; the only distinctions to be traced lie in the apically black hind tibiae and their tarsi and the presence of an areolet, found to be wanting in two wings of some six specimens. It is described from Prussia; Bridgman took a female at Earlham near Norwich in the middle of September, 1879, and Bignell found another at Longbridge in Devon on 25th August. The former adds that J. E. Fletcher bred both sexes, probably at Worcester, from *Eriocampa varipes*, and suggests that, since two specimens each with a defective areolet were recorded, the outer submarginal nervure was sometimes wanting. The present species was known to Stephens and Desvignes under the name *Tryphon quadrilineatus*, Grav., which was thought to be a *Lissonota* by Brischke and proved to be *Cryptopimpla blanda*, when Pfankuch examined the type in 1906.

14. *lateralis*, Grav.

Tryphon lateralis, Gr. I. E. ii. 690; Ste. Ill. M. vii. 255, ♂. *Syndipnus punctiscuta*, Thoms. O. E. xix. 2005, ♂ ♀.

A small black species with the abdomen indefinitely in its centre and all the legs except basally red, the nervellus strongly postfurcal and intercepted distinctly a little above its centre; ♂ face entirely flavous. Length, $5\frac{1}{2}$ —7 mm.

This and the last-described species are closely allied and superficially inseparable; both have the basal segment uneven and bicarinate to its centre where it is transimpressed, the abdomen more or less broadly and indefinitely red centrally, often binotated or transfasciated with black or only laterally black on 2nd and 3rd segments, with the extreme anal segments apically testaceous, the legs red with only the base of the hind and sometimes of the anterior black, the areolet wanting, radix and tegulae white, thorax immaculate with areola small and triangular. But *E. notatus* has the nervellus distinctly antefurcal, intercepted far below its centre and the ♂ face immaculate black, whereas in *E. lateralis* the nervellus is postfurcal and intercepted above its centre, with the ♂ face flavous throughout.

This species has hitherto been but little understood; Gravenhorst knew it only from Shropshire, and I have seen three males in Stephens' collection "taken in the neighbourhood of London in June"; three others in Mus. Brit. were found by Desvignes, and the last by Marshall

at Cheltenham, Govilon in south Wales, and Cornworthy in Devon. I owe a female from Giffnock, taken in June, 1899, to Mr. Dalglish's generosity, and myself swept a male on 1st September, 1910, in a salt-marsh at Southwold in Suffolk. It had most probably been previously overlooked on the Continent, since Thomson records it not only from Sweden in 1895, but also from both France and Germany.

NOTOPYGUS, *Holmgren*.*

Holmgr. Sv. Ak. Handl. 1855, p. 115.

This genus very closely resembles *Euryproctus* in facies and all essential details; but may at once be known therefrom by the apically truncate clypeus, unevenly impressed base of the often discally bicarinate second segment and in having all the following in ♀ distinctly emarginate. I cannot tell why Marshall placed *Ichneumon sponsorius*, Grav. 1820—a parasite of this name was first described by Fabricius in 1781, as *Anomalon sponsorius* by Jurine in 1807 and given by most of the old authors—under the present genus in his 1870 Catalogus; it was recorded by Stephens under *Mesoleptus* as British in 1835, but omitted from Desvignes' Catalogue; and I find the two representatives in Mus. Brit. are *Exyston cinctulum* and *E. brevipetiolatum*, of the former of which Pfankuch tells us that Gravenhorst's type is a variety. For Marshall's second species, cf. Ichn. Brit. ii. 251; but, correct as the synonymy there adopted appeared, Pfankuch has since found the type of *T. subrufus* to be a malformed example of *Tryphon consobrinus*; so Haliday's name must stand for our Cryptid. Thus no *Notopygus* was known in Britain till 1882, when the following species was introduced. Thomson says two species of this genus are probably parasitic upon *Lyda*.

1. *emarginatus*, *Holmgr.*

Notopygus emarginatus, Holmgr. Sv. Ak. Handl. 1855, p. 115, ♂ ♀; Voll. Pinac. vii, pl. xxxi, fig. 1, ♂; cf. Thoms. O. E. xix. 1893.

A black and somewhat nitidulous species with antennae white-banded, and most of abdomen and legs red. Head rounded posteriorly with centrally emarginate and not very broad vertex; ♂ with mouth, clypeus and face flavidous. Antennae as long as body, infusate, rufescent beneath, with a broad white band considerably beyond their centre; scape of ♂ flavous below. Thorax immaculate black and closely punctate, with strong notauli coalescent in mesonotal disc; metathoracic carinae strong and spiracles circular, but costulae wanting; areola continuous with petiolar area and extending subdivergently from base to apex. Scutellum deplanate and punctate. Abdomen clear red with the first segment except apically, and anus, black; basal segment parallel-sided to beyond the central prominent spiracles, and thence a little explanate, strongly sulcate and bicarinate throughout, with postpetiole acutely margined; second segment coriaceous, discally bicarinate and laterally carinately reflexed basally; hypopygium of ♀ large, convex and apically rounded;

* Stephens records (Ill. M. vii. 212) *Mesoleptus narrator*, Grav., as British, but there are none in his collection and it has not been noticed with us since 1835. It consequently lacks confirmation. Gravenhorst's type is *Notopygus analis*, Holmgr., differing from the following species in its wanting areolet, etc.

terebra straight, emitted from circular orifice. Legs neither slender nor elongate, red with coxae and hind femora alone black; hind tibiae somewhat short and hardly infusate apically; anterior coxae and trochanters of ♂ flavous; ♀ hind femora stout. Wings not broad, hyaline with stigma narrow and dull testaceous, radix and tegulae flavidous; areolet petiolate, with the outer nervure wanting below and continuous with the 2nd recurrent, which is broadly fenestrate; basal nervure continuous; nervellus opposite and intercepted hardly below centre. Length, 9—10 mm.

Very rare in Sweden, says Holmgren, and the male figured by Van Vollenhoven does not appear to be Dutch, though Tosquinet records it from Belgium and Gaulle from France. The only known British example of this genus was correctly named by Bridgman (Trans. Ent. Soc. 1882, p. 156), captured by Cameron at Kingussie in Inverness, and acquired from him by the British Museum in 1898; it is from it that I have drawn the above male description.

PERILISSUS, *Holmgren*.

Holmgr. Sv. Ak. Handl. 1854, p. 61; 1855, p. 121.

Head generally strongly buccate posteriorly, always with the subemarginate vertex very broad, subquadrate, occasionally subglobose, rarely a little transverse; clypeus hardly convex and usually distinctly discreted basally; mandibular teeth always of unequal length. Antennae setaceous and often longer than the body; scape subovate, basal flagellar joint always longer than the second. Thorax dull, metanotum with areola nearly always entire, petiolar area strong, costulae variable. Abdomen oblong-ovate or subfusiform, of ♀ apically a little compressed; basal segment either gradually narrowed to its base or a little curved before the spiracles with discal sulcus and carinae wanting or strongly obsolete; spiracles somewhat antemedian and petiole not parallel-sided; terebra straight. Legs slender, tarsal claws simple or hardly setose. Wings subample, stigma of normal size; areolet always distinct, usually suborbiculate, rarely sessile and triangular; second recurrent half pellucid.

It is decidedly more convenient to allow our eleven species to represent a single genus than to divide them, as was done generically by Förster and subgenerically by Thomson, or even like Pfankuch to recognise only *Ecclinops* and *Polyoncus* as distinct. The character of the posteriorly intumescens and often explanate head is sufficient to distinguish all the species here placed from the allied genera, excepting only *Eclytus*, though the stouter and more thick-set *Laphyroschopus* are less homogeneous than the other groups on account of their rather more transverse vertex, shorter legs and petiole, and the often elevated metanotal carinae with subquadrate areola. Recent investigations have altered the great majority of the names hitherto employed in our catalogues, fortunately before they had become familiar to British students; and the number of our known species is doubled since 1872. Of the species enumerated in Marshall's list, *P. flavopictus* is said to be a *Mesoleius* and Pfankuch could not find the type, though he tells us that *P. modestus* is a Pimplid and that *P. limitaris* is the ♀ of Gravenhorst's *P. naevius*, of which the ♀ and var. are a *Mesoleius*; and I have no doubt respecting the synonymy of Stephens' species, the type of which I have

examined, with *P. subcinctus*, now known to entirely differ from *M. luteolator*, Grav. It appears inadvisable to at present admit *P. sericeus*, Grav., as indigenous since it has not been found with us since Stephens recorded it (Ill. M. vii. 212) "near London"; it is distinct from all our known kinds in its large stigma and shining pubescent abdomen and is well described (Stiern. Tryphon. p. 63) by Strobl.

Table of Species.

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|-------|---|-------------------------|
| (20). | 1. Head large and subcubical; slender and usually large species. | |
| (17). | 2. Head hardly broader than thorax, posteriorly subparallel-sided. | |
| (16). | 3. Discoidal cell not apically acute below; abdomen red-marked. | |
| (9). | 4. Nervellus intercepted above centre; clypeus coarsely punctate [SPANOCTONUS]. | |
| (8). | 5. Metanotal costulae distinct; mouth and hind coxae red. | |
| (7). | 6. Abdomen dull and pilose; antennae entirely testaceous | 1. FILICORNIS, Grav. |
| (6). | 7. Abdomen shining and glabrous; antennae mainly infusate | 2. LUTESCENS, Holmgr. |
| (5). | 8. Metanotal costulae wanting; mouth and hind coxae black | 3. RUFONIGER, Grav. |
| (4). | 9. Nervellus not intercepted above centre; clypeus finely punctate [ECCLINOPS]. | |
| (13). | 10. Metanotal costulae entire; head usually pale. | |
| (12). | 11. Body entirely pale testaceous, hind coxae concolorous | 4. PALLIDUS, Grav. |
| (11). | 12. At least thorax mainly black, hind coxae usually concolorous . . | 5. SPILONOTUS, Steph. |
| (10). | 13. Metanotal costulae wanting; head mainly black. | |
| (15). | 14. Petiole of normal length; whole face pale | 6. ORBITALIS, Grav. |
| (14). | 15. Petiole distinctly short; facial orbits alone pale | 7. TRIANGULATUS, Bridg. |
| (3). | 16. Discoidal cell apically acute below; abdomen not red [PERILISSUS] . . | 8. NAEVIUS, Gmel. |
| (2). | 17. Head broader than thorax, buccate behind; costulae wanting [POLYONCUS]. | |
| (19). | 18. Nervellus postfurcal; head and centre of abdomen red | 9. ERYTHROCEPHALUS, Gr. |
| (18). | 19. Nervellus opposite; head black; abdomen apically red | 10. BUCCINATOR, Holmgr. |
| (1). | 20. Head broader than long; stout and small species [LAPHYROSCOPUS]. | |
| (22). | 21. Metanotal costulae strong; mesosternum flavous | 11. LUTEOLATOR, Grav. |
| (21). | 22. Metanotal costulae wanting; mesosternum black. | |
| (24). | 23. Stigma infusate; metanotal areae strong and distinct | 12. PICTILIS, Holmgr. |
| (23). | 24. Stigma clear testaceous; metanotal areae nearly wanting | 13. MINUTUS, Bridg. |

1. *flicornis*, Grav.

Ichneumon flicornis, Gr. Mem. Ac. Sc. Torin. 1820, p. 368, ♂.* *Mesoleptus flicornis*, Gr. I. E. ii. 94; Ste. Ill. M. vii. 227; Blanch. Hist. Nat. Ins. iii. 308; Fonsc. Ann. Soc. Fr. 1849, p. 215, ♂ ♀. *Perilissus flicornis*, Holmgr. Sv. Ak. Handl. 1854, p. 63; *lib. cit.* 1855, p. 121; Voll. Pinac. pl. xxxiii, fig. 1, ♂ ♀; cf. *Spanotecnus flicornis*, Thoms. O. E. ix. 911. *M. seminiger*, Gr. I. E. ii. 93, ♀; Ste. Ill. M. vii. 226; *P. seminiger*, Voll. Pinac. pl. xxxiii, fig. 2; *Hadrodactylus seminiger*, Thoms. O. E. ix. 921.

Punctate and a little shining, with all the coxae and usually the abdomen red. Head tumidulous, and not constricted posteriorly, closely punctate; frons dull, face slightly convex and very closely punctate; clypeus not discreted, sparsely punctate, apically rounded and coarsely punctate; ♂ with mouth and clypeus stramineous, mandibles apically infusate and the face rarely badius-spotted or entirely testaceous; ♀ with mouth rufescent. Antennae very slender, distinctly a little longer than the body, entirely rufescent, or in ♂ subinfusate towards their apices. Thorax closely punctate, with not very distinct notauli; metathorax more shining and very distinctly areated with costulae distinct, upper lateral areae subquadrate and areola elongate-hexagonal. Scutellum subconvex. Abdomen subsericeous and oblong-ovate; more or less rufescent from apex of first or of second segment, usually with anus infusate or black, very rarely entirely black with the third segment alone badius; basal segment subconvex, very slightly curved, smooth or obsoletely sulcate, with postpetiole slender, hardly explanate, longer than broad and fully as long as the parallel-sided petiole; spiracles distinct; terebra ferrugineous and very shortly exerted. Legs slender, red or testaceous; hind femora usually entirely or centrally nigrescent or black. Wings not small, subhyaline with stigma and radius piceous, the former basally paler or entirely testaceous; radix and tegulae testaceous; areolet suborbicular and a little petiolate, second recurrent nervure nearly half pellucid; nervellus very strongly postfurcal, intercepted above centre. Length, 6—9 mm.

The always present though occasionally fine metanotal costulae, strongly postfurcal nervellus and pale hind coxae will distinguish this species, the colour of whose abdomen, face and hind femora is extremely variable. The var. *seminiger* differs solely in having the face and cheeks pale red.

It occurs with considerable frequency in northern Europe, in Italy, and probably throughout the palearctic region; Brischke alone appears to have bred it (Schr. Phys. Ges. König. 1871, p. 69), and he found it emerged from larvae of *Nematus latipes*, of *N. fraxini*, of *N. Erichsoni* and from those of an unnamed species of *Dolerus*, in Prussia. This species has occurred to me annually since 1868 from 27th May to 4th July only, and always by sweeping reeds in very marshy places; it certainly cannot be termed common in the eastern counties, since I have not found a dozen examples in as many years and it always turns up singly. In Suffolk it has been found at Stanstead Wood, Bentley Woods (once in ten

* I am at a loss to know what *Ichneumon variator*, Müll. (Zool. Dan. Prodr. 1776, 157) may be. Gravenhorst regarded it as distinct from *I. flicornis* in 1820; but synonymous with his own *I. variator* of that date and *M. flicornis* of 1829. Marshall perpetuated its individuality in 1872 by synonymising it only with Gravenhorst's var. 1 of *M. flicornis* (pronounced to be nothing but var. *seminiger* by Pfank.) probably on account of Stephens' description, which looks like a ♂ *seminiger*, from the London district, though no examples are now in his collection. Let it lapse: *flicornis* is a sufficiently appropriate name.

years' constant collecting there), Mildenhall, Brandon, Herringswell Fen, Henstead Marsh; in Cambs. at Chippenham Fen; in Norfolk in Surlingham Marsh; and in the New Forest at Matley Bog. On 14th of July, 1898, I took a female at 10.45 p.m. flying around an electric arc lamp in Ipswich, evidently attracted by the light. It is very widely distributed with us, as the following localities will show:—Nunton, Govilon and Botusfleming (Marshall); Lastingham in Yorks (Roebuck); Whitby (Beaumont); Lepton near Huddersfield (Porritt, Yorks. Nat. 1882, p. 57); Lands End (Marquand); very common in Norfolk (Bridgman), Kings Lynn, Norfolk (Atmore); Bolt Head, Devon (Bignell); Glanvilles Wootton, Dorset, common (Dale); Norbury, Surrey, 10th June (Brunetti); several at Wimbledon, June, 1910 (Stenton); Shere (Capron); Sanderstead, Surrey (Champion); St. Issey, Cornwall (Davies); Weymouth (Richardson); Shotover, Oxford, 20th Sept., 1902 (Hamm); Felden, Herts (Piffard); Cannock Chase (Tomlin); Guestling, Sussex (Bloomfield); Hastings (Esam); Much Markle, Hereford, 27th May, 1902 (Col. Yerbury); Banchory in Kincardine, in Sept. 1910 (Elliott), and Bishop-ton in early July, 1899 (Dalglish). A long series in Mus. Brit. was named by Gravenhorst, Desvignes and Stephens, who records this species correctly from London, Netley, Combe [N.B. This is his MS. label *Cb.*] and Darenth Woods in June.

2. *lutescens*, Holmgr.

Perilissus lutescens, Holmgr. Sv. Ak. Handl. 1855, p. 125, cf. p. 379; Brischke. Schr. Phys. Ges. König. 1871, p. 71; Schr. Nat. Ges. Danz. 1878, p. 73, ♂ ♀. *P. (Spanotecnus) lutescens*, Thoms. O. E. ix. 212.

A distinctly shining and very finely punctate species with the whole abdomen, except basally, and legs fulvous. Head black, posteriorly broad with apex of clypeus, the mouth and base of antennae beneath, pale. Thorax immaculate black, metanotal areae complete and costulae strong. Abdomen clear fulvous, with only the first segment to centre of postpetiole black; basal segment narrow with obsolete discal sulcus. Legs immaculate fulvous, very rarely with apices of hind tibiae infuscate. Wings with stigma broad and usually nearly black; nervellus intercepted distinctly above its centre. Length, 5—6 mm.

Its colouration and size render it distinct in the present genus; but it is very liable to be confused with *Euryproctus atomator*, from which it differs in its posteriorly longer head, very distinct metanotal costulae, broader areola, the structure of the basal segment which is mainly black, and especially in the distinctly supracentral interception of the nervellus.

It is only recorded from Sweden, France and Prussia, where Brischke raised it from larvae of the terribly destructive Black-Jack, *Athalia spinarum*, and subsequently from those of *Nematus Erichsoni*. It was first introduced as British by Bridgman (Trans. Ent. Soc. 1889, p. 432) on the strength of a ♂ captured by Bignell on 3rd of May (or, more probably, as given by the latter [Trans. Devon. Assoc. 1898, p. 496] August), 1886. It is probably not very rare in woods, however, since there are several in Mus. Brit., found by Desvignes and Rev. T. A. Marshall at Milford Haven and Cornworthy in Devon; and I swept a couple of females from a bed of *Scutellaria galericulata* among alders at Matley Bog, in the New Forest on 23rd August, 1901.

3. *rufoniger*, Grav.

Ichneumon rufoniger, Gr. Mem. Ac. Sc. Torin. 1820, p. 368, ♀. *I. vernalis*, Gr. l. c. p. 380, ♂ ♀. *Mesoleptus rufoniger*, Gr. I. E. ii. 80, cf. i. 684, ♂; Ste. Ill. M. vii. 224, ♀. *Tryphon vernalis*, Gr. I. E. ii. 294; Ste. Ill. M. vii. 260; Fonsc. Ann. Soc. Fr. 1849, p. 231, ♂ ♀. *Euryproctus rufoniger*, Holmgr. Sv. Ak. Handl. 1855, p. 111, ♀. *Perilissus vernalis*, Holmgr. l. c. p. 122; Voll. Pinac. pl. xxxiii. fig. 3; *Spanotecnus vernalis*, Thoms. O. E. ix. 911, ♂ ♀. *Tryphon petulans*, Gr. I. E. ii. 275; Ste. Ill. Man. vii. 259; Fonsc. Ann. Soc. Fr. 1849, p. 228, ♂.

Very closely punctate and hardly at all nitidulous, with head immaculate black. Head not pale marked, subtumidous and not at all constricted posteriorly; frons deplanate and strongly punctate; face subconvex; clypeus rugulose, coarsely punctate and apically truncate, mandibles black with the teeth subequal and very short. Antennae nearly as long as body, slender, infusate with flagellum rarely basally testaceous. Thorax narrower than head, black; metanotum punctate, incompletely areolated with no costulae, but with areola elongate, centrally dilated and base of petiolar area distinct; spiracles circular. Scutellum margined to its centre. Abdomen more or less broadly red centrally, usually pale from apex of first (*vernalis*) or of second (*rufoniger*) segment to base of fifth; basal segment dull, black, narrow, apically gradually dilated with no carinae, and spiracles a little before its centre, petiole parallel-sided and shorter than postpetiole; hypopygium transverse, apically truncate; terebra black, reaching anus. Legs slender and black with tibiae, tarsi and the anterior femora testaceous; hind tibiae apically, and intermediate femora basally, sometimes infusate. Wings subhyaline with stigma and tegulae testaceous; areolet and recurrent nervure as in the last species; radial nervure apically straight; nervellus a little postfurcal and intercepted above centre. Length, $6\frac{1}{2}$ —9 mm.

Known by the black mouth and coxae, duller metanotum, lack of costulae, shorter basal segment, narrower radial cell and much less postfurcal nervellus from *P. filicornis*.

Holmgren found it from 23rd to 30th May in Sweden, and that is when it is commonest with us in normal years; but it is said to also occur in June and the male to be much the more frequent sex by Gravenhorst, who named an example of that sex now in Mus. Brit. Brischke enumerates some varieties and says (Schr. Phys. Ges. König. 1871, p. 70) that he bred this parasite from larvae of a species of *Tenthredo*, referred by Gaulle to the genus *Nematus*. It occurs over most of Europe and the whole of England, at least to Yorkshire; I have records from Netley in Shropshire (Hope); Shropshire, New Forest and near London in May and June (Stephens, though none are in his collection); Yorkshire in June (Porritt, Yorks Nat. 1882, p. 57); Lands End (Marquand); common in Norfolk (Bridgman); Shere (Capron) and Greenings in Surrey in May, 1872 (W. Saunders); New Forest (Miss Chawner). Mr. F. C. Adams takes it with some freedom in his Lyndhurst garden from the last week in May to 17th June; and Mr. W. H. Tuck found some females at Tostock in Suffolk early in June, 1900; the only example I have captured was on grass at Claydon bridge near Ipswich as late as 25th June, 1903. Charbonnier has given me a male with black stigma, which he took at Freshford, near Bath in May.

4. *pallidus*, Grav.

Mesoleptus pallidus, Gr. I.E. ii. 30, ♂ (*nec* Ste.). *Perilissus pallidus*, Holmgr. Sv. Ak. Handl. 1855, p. 124, ♂ ♀; Voll. Pinac. pl. xxxiii, fig. 5, ♂. *P. (Ecclinops) pallidus*, Thoms. O. E. ix. 914.

An entirely testaceous species with only the eyes, ocelli, mandibular apices and a small dot behind the front tegulae, black. Metanotal areola fine, entire and basally subexplanate, basal area elongate and sublinear, costulae distinct but fine, petiolar area small, strong and semilunate; basal segment laterally evenly a little explanate throughout from the sub-constricted centre of the petiole; areolet petiolate and strongly oblique, emitting the half pellucid second recurrent nervure from its extreme apex; basal nervure strongly curved, and below but slightly postfurcal; nervellus a little postfurcal, intercepted at its centre. Length, 6—7 mm.

Instantly known in the present genus by its entirely pale colouration which, however, so closely resembles that of such species as *Prionopoda strictica*, *Mesoleptus testaceus*, etc., that the above details appear necessary.

This species probably occurs with some frequency throughout northern Europe; and Brischke says (Schr. Phys. Ges. König. 1871, p. 70) that he bred it from *Tenthredo repanda*, though the statement is not repeated, as is usual, in his later work (Schr. Nat. Ges. Danz. 1878, p. 73): the host is relegated to the genus *Selandria* by Vollenhoven. With us it is certainly rare and all our older authors misunderstood it; it is not represented in Stephens' nor Desvignes' collections; but Marshall took four examples of Thomson's var. *albitalarsis* at Cheltenham, London and Cornworthy in Devon. The only typical ♀ I have taken flew indoors to artificial light on the dinner table at Monk Soham House at 9 p.m. on 7th August, 1910. Records are very scanty; T. Wilson of Holgate records it (Yorkshire Naturalist, 1881, p. 153) as recently taken by him about York, and Bridgman professes (Trans. Norfolk Nat. Soc. 1894, p. 625) to have found it at Brundall and Horning Ferry, in the Broads, during June and July.

5. *spilonotus*, Steph.

Mesoleptus spilonotus, Ste. Ill. M. vii. 227, ♀. *Perilissus subcinctus*, Holmgr. Sv. Ak. Handl. 1855, p. 123; Brisch. Schr. Phys. Ges. König. 1871, p. 70; Schr. Nat. Ges. Danz. 1878, p. 72; *lib. cit.* 1891, p. 60; *P. (Ecclinops) subcinctus*, Thoms. O. E. ix. 914, ♂ ♀.

Head a little buccate and hardly constricted behind eyes with whole clypeus, palpi, mandibles, and sometimes facial orbits above, testaceous; frons deplanate, dull and closely punctate; face punctulate and sub-prominent; clypeus obsoletely discreted, apically subtruncate. Antennae very slender, as long as body, infusate ferrugineous and basally paler below. Thorax narrower than head, finely punctate with notauli apically distinct and pleurae aciculate; metanotum distinctly areated with areola elongate and not reaching base, lateral costulae entire and areae broader than long. Abdomen black with the apical half or only incisure of second segment and base of third more or less broadly rufescent, remainder black and pale-pilose; basal segment stout, narrow, sulcate beyond its

centre, with inconspicuous spiracles and very slightly explanate post-petiole; anus of ♀ subcompressed. Legs slender, rufescent-testaceous, with hind coxae entirely or basally nigrescent and hind femora sometimes concolorous. Wings subhyaline, stigma pale infusate-testaceous, areolet obliquely subquadrate or minute and irregularly petiolate, nervellus intercepted nearly at its centre. Length, 5—6 mm.

This is the description of Holmgren's form but the colouration is extremely variable, which fact has led to its incorrect mingling with *P. luteolator* and *P. erythrocephalus*, since the head in the typical form is red with only the eyes and ocellar region black, the prothorax and entire legs concolorous, often with only the first segment of the red abdomen basally or entirely black; occasionally the mesonotal vittae are broadly red. The quadrate head, which is posteriorly as broad though no broader than the eyes, elongate basal metanotal area, strong costulae, the position of the nervellus and always distinct notauli, will serve to distinguish this conspicuously slender species.

I have no hesitation in considering the synonymy here adopted correct.

Not a rare species with us, but apparently confined to the month of June. Very common in Norfolk (Bridgman), Bickleigh in Devon early in September (Bignell); I have found the type in Mus. Brit., which Stephens took at Coombe Wood ["Cb."], along with others at Darenth wood, in June; Desvignes had several, called by him *erythrocephalus*; and Marshall mixed a female, from Cornworthy in Devon, with *vernalis*. It has been sent me from Greenings in Surrey, 1871 (W. Saunders), Fel-den in Herts (Piffard) and Tostock in Suffolk (Tuck), where I have swept several from low herbage at Brandon, Barton Mills and Tuddenham, from 9th to 12th June only.

6. *orbitalis*, Grav.

Tryphon orbitalis, Gr. I. E. ii. 254, ♂. *Perilissus bucculentus*, Holmgr. Sv. Ak. Handl. 1855, p. 123, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 72 (*nec* Voll. Pinac.). *P. (Ecclinops) orbitalis*, Thoms. O. E. ix. 913, ♂ ♀.

Closely punctulate and a little shining, black; a small and stout species, with pale orbits and centre of abdomen. Head broader than thorax, sub-cubical, tumidous behind eyes; mouth, face, cheeks and usually the external orbits broadly flavidous or testaceous. Antennae slender, filiform and longer than body; testaceous below. Thorax closely punctulate, with apical notauli; mesopleurae alutaceous, not punctate; metathorax dull with areola elongate and subparallel-sided, costulae wanting and petiolar area basally distinct. Scutellum black and sub-convex. Abdomen pale red with first segment except apically, and anus from apex of fourth or fifth, black; basal segment somewhat dull, hardly sulcate above the central and subprominent spiracles; second transverse; terebra and ♂ valvulae a little exserted. Legs slender and testaceous with all coxae basally or hind ones entirely, and hind femora usually more or less, nigrescent; tarsi almost pectinate. Wings with radix and tegulae stramineous, stigma piceous or infusate; areolet large, irregularly

orbiculate and subpetiolate; nervellus antefurcal, intercepted far below centre. Length, 5—6½ mm.

It differs from *P. erythrocephalus*, which it is said to resemble, in its less tumidous head, lack of metanotal costulae and shorter basal segment.

Probably uncommon in northern Europe, and found during May in Germany. With us it certainly appears rare and was not introduced till 1881 (Trans. Ent. Soc. p. 163), when Bridgman noticed an unlocalised example from Mr. E. A. Butler's collection. Marshall once found the males "very rare" at Rannoch; Piffard took a female at Felden; and Atmore has sent both Bridgman and me several from his Kings Lynn garden, where they occurred during June and in August, 1904. I have twice met with the female by sweeping in Tuddenham Fen in Suffolk about the middle of June, 1900, and in early July, 1909, in Matley Bog in the New Forest.

7. *triangulatus*, Bridg.

Perilissus triangulatus, Bridg. Trans. Ent. Soc. 1886, p. 362, ♂ ♀. (?) *Mesoleptus ventralis*, Curt. B. E. 644, ♂.

A dull species with black hind legs, the abdomen basally red and petiole unusually short. Head posteriorly not narrower than eyes; mouth, mandibles, clypeus and facial orbits triangularly, testaceous; clypeus not discreted, cheeks long, face closely and distinctly punctate. Antennae as long as body, infusate with scape and base of the flagellum pale beneath; lower mandibular tooth the longer. Thorax immaculate black, with notauli apically distinct and mesopleurae finely punctate; metanotum finely rugose, with the areola elongate or wanting. Scutellum hardly convex and only basally margined. Abdomen subclavate, dull red with only the anus from apex of fifth segment black; basal segment short and sulcate to near apex but not carinate, with distinctly antecentral spiracles; petiole not broader than long, basally subconstricted; postpetiole longer than broad, slightly explanate apically, coriaceous, apically smooth; terebra slightly exserted. Legs somewhat slender; anterior red with coxae and, except apically, trochanters black; hind legs black with their tibiae broadly in centre, or except apically, subbadius. Wings with tegulae whitish; stigma infusate stramineous, basally paler; areolet small, suborbiculate and petiolate; nervellus subopposite, intercepted distinctly below its centre. Length, 9 mm.

I know nothing about this species, the structure of whose face Bridgman says is like that of *P. filicornis* and of whose basal segment is "more the shape of *Mesoleius* than *Perilissus*." It was described from examples taken at Peckham and Dulwich on May 30th, 1885, and has not since been noticed.

There is, however, a male in my collection which I have not the least hesitation in referring to *Mesoleptus ventralis*, Curt. (B. E. 644), so exactly agreeing with the above description by Bridgman that I quite expect his insect will prove but a colour variety of Curtis' unlocalised though British species. My specimen has the clypeus, flagellum and abdomen except the obsoletely badius incisures, black; the facial markings are triangularly pale and the lower mandibular tooth distinctly the longer; the

anterior trochanters are flavescent with black markings. My example was captured by Mr. W. H. Tuck, M.A., on 13th June, 1900, at Tostock, near Bury St. Edmunds.

8. *naevius*, Gmel.

Ichneumon naevius, Gmel. S. N. 1790, 2699, ♂. *Mesoleptus limitaris*, Gr. I. E. ii. 14; Ste. Ill. M. vii. 213, ♀; Drews. Arch. f. Naturg. 1836, p. 36, ♂; Ratz. Ichn. d. Forst. ii. 119, ♂ ♀. *Tryphon naevius*, Gr. I. E. ii. 152, excl. ♀ et var.; Ste. Ill. M. vii. 236, part.; *T. limitaris*, Blanch. Hist. Nat. Ins. iii. 307. *Mesoleius naevius*, Holmgr. Sv. Ak. Handl. 1854, p. 70, ♂ ♀. *Perilissus limitaris*, Holmgr. l. c. 1855, p. 124, cf. 1856, p. 379; Thoms. O. E. ix. 913, ♂ ♀.

Somewhat dull and closely punctate, with abdomen not red-marked. Head subcubical and dull, closely punctate; ♀ with the discreted clypeus and mouth flavous or red, ♂ with face and cheeks also concolorous; mandibular teeth obtuse and of subequal length. Antennae fully as long as body, slender, filiform and infusate, testaceous with scape flavous beneath. Thorax black with a line or dot before radices and a pectoral mark in ♀ castaneous and in ♂, together with margin of prothorax and pleural suture, flavous; metanotal areae always distinct, the lateral broad and very rarely discreted by costulae. Scutellum rarely apically pale. Abdomen subfusiform and black with at least segments four to seven laterally, and narrowly at their apices, whitish; basal segment very closely and coriaceously punctulate, dull, basally narrow, laterally finely margined and gradually explanate apically, with postpetiole longer than the centrally subconstricted petiole and not sulcate; venter flavidous; terebra shortly exerted. Legs normal and fulvidous, sometimes with the anterior basally flavidous; tibiae flavescent; hind tarsi and apices of their tibiae infusate; tarsal claws almost pectinate. Wings ample and hyaline, stigma infusate, radix and tegulae flavescent; areolet triangular and subpetiolate; discoidal cell subacute below; nervellus slightly ante-furcal and intercepted nearly in its centre. Length, 5—8 mm.

It occurs during May and June in Germany, Sweden, Denmark and France; it was bred by Drewsen from *Nematus ribesii*, Scop., according to Ratzeburg (l. c.) and by Brischke (Sch. Phys. Ges. König. 1871, p. 71) from larvae of the synonymous *N. ventricosus*. Stephens says it used to be found about London, but gives July, a month into which it does not appear to extend, though there are several from his collection in Mus. Brit., along with a male named by Gravenhorst, and one taken in the Plumstead marshes by Marshall. This is certainly a garden insect and is doubtless beneficial in destroying the gooseberry saw-fly there. I have a long series from Redland near Bristol, where Charbonnier used annually to take it in his garden during May; Esam has given it me from Hastings, Piffard from Felden, Adams from Lyndhurst in June and Capron from Shere. It has occurred to me rarely: in a Newport garden in Isle of Wight as late as 25th June, 1907, and sitting on a lilac bush in a Tuddenhams garden early in June, 1910. Stenton has a long series from Wimbledon.

9. *erythrocephalus*, Grav.

Tryphon erythrocephalus, Gr. I. E. ii, 220, ♂. *Perilissus erythrocephalus*, Holmgr. Sv. Ak. Handl. 1855, p. 122, ♂ ♀; Voll. Pinac. pl. xxxii, fig. 7; *P. (Polyoncus) erythrocephalus*, Thoms. O.E. ix. 913.

Somewhat shining and very closely punctulate, with head red. Head large and nearly globose, closely punctate, fulvous and nearly always with marks at ocelli and occiput black; not constricted behind the very small eyes; vertex very broad and nearly quadrate. Antennae filiform and a little longer than the body, fulvous beneath. Thorax narrower than head, stout, dull and very closely punctulate above; prothorax often fulvous; pleurae sparsely punctate, with a nitidulous area at metapleural suture; metanotum distinctly arcuated, with petiolar area elongate. Scutellum punctate and a little convex. Abdomen clavate, shining and black with the second segment entirely or partly, and base of third, red; basal segment gradually explanate apically, sparsely punctate, with obsolete or no discal sulcus; terebra curved. Legs somewhat slender, black with front femora and anterior tibiae fulvous; hind tibiae infusate-testaceous; calcaria elongate. Wings with stigma infusate-testaceous, tegulae nigrescent and radix pale; areolet not small, triangular and sessile; nervellus intercepted a little above its centre. Length, $6\frac{1}{2}$ — $7\frac{1}{2}$ mm.

This is a rare species in Germany, Sweden and France. Desvignes did not understand it and I have seen no indigenous examples. Bridgman records it from Britain (Trans. Ent. Soc. 1889, p. 433) on the strength of an unlocalised specimen in C. W. Dale's collection, which the latter tells us (E.M.M. 1890, p. 24) was captured by himself, with a second at Glanvilles Wootton in Dorset on 30th July, 1888; these are presumably now in the Oxford Museum.

10. *buccinator*, Holmgr.

Perilissus buccinator, Holmgr. Sv. Ak. Handl. 1855, p. 122, ♀. *P. (Polyoncus) buccinator*, Thoms. O. E. ix. 913, ♀.

A very stout and very dull species with the head quadrate and unusually large, even in the present genus. Mouth, underside of antennae, often apex of scutellum, abdomen except basally, and the anterior legs only, rufescent; hind legs infusate or nigrescent throughout with only the trochanters or in ♂ also coxae apically testaceous, with calcaria and all the tarsal joints at their extreme base whitish. Metanotum short, convex, scabriculous and dull with areola strong, broad and nearly oval; costulae of ♀ wanting; petiolar area basally strong but not occupying more than the apical third. Basal segment discally curved, dull, narrow and black with subcentral spiracles and only sulcate at its base; ♂ anus deplanate, ♀ anus subcompressed with terebra not exerted. Areolet petiolate, obliquely subquadrate and entire, emitting recurrent nerve nearly from its centre; nervellus opposite and intercepted hardly above its centre. Length, $6\frac{1}{2}$ —8 mm.

Unmistakable in the very dull thorax and head, in the size of the latter, combined with the black hind legs and immaculate red anus. The ♂ has not before been described.

Holmgren knew a single ♀ captured in Smolandia in Sweden by Boheman, and it was probably this that Thomson reviewed in 1883; Gaulle records the species from France in 1908. It has not hitherto been noticed in Britain, but I possess a full series of five examples, comprising both sexes, which was captured, presumably in the neighbourhood



of Shere in Surrey, by Dr. Edward Capron some twenty years ago; and a ♀ found at Felden in Herts by Mr. Albert Piffard about the same time. The ♂, so well figured by Stenton, was taken by him at Wimbledon Common in Surrey during June, 1909.

11. *luteolator*, Grav.

Mesoleptus luteolator, Gr. I. E. ii. 42; Ste. Ill. M. vii. 217, ♂. *Tryphon Gorskii*, Ratz. Ichn. d. Forst. iii. 126, fig. ♂; Gorski, Anal. ad Entomogr. 1852, p. 200, fig. ♂ ♀. *Perilissus Gorskii*, Holmgr. Sv. Ak. Handl. 1855, p. 125, ♂; l. c. 1856, p. 379, ♀; Voll. Pinac. pl. xxxii, fig. 6; *Luphyroscopus Gorskii*, Thoms. O. E. ix. 915, ♂ ♀.

A short and stout species, very finely punctate and somewhat shining; flavous, discally black. Head tumidulous and broad behind eyes, dull; flavous or fulvidous with occiput and centre of frons to scrobes, rarely to clypeus, black. Antennae as long as body, infusate and basally paler. Thorax nearly as broad as head, shining and finely punctate, with sternum testaceous; prothorax often entirely pale; mesothorax black

with notauli obsolete, mesopleurae broadly and rarely two mesonotal vittae fulvous; metathorax pale beneath, discally fully carinate with basal area short, areola subquadrate, costulae strong and petiolar area entire. Scutellum subconvex and black, or red or flavous with its base darker; frenum concolorous. Abdomen pilose and somewhat short, flavous with first segment entirely and the following usually broadly on the disc black; basal segment subdeplanate, punctulate, dull, centrally subsulcate with its postpetiole broad and apically thrice broader than the short and centrally subconstricted petiole, spiracles not prominent. Legs short and not slender, clear testaceous with only the hind tarsi and apices of their basally constricted tibiae infuscate. Wings hyaline with stigma piceous, radix and tegulae stramineous; areolet and recurrent nervure as in the preceding species; radial cell short and broad; nervellus antefurcal and intercepted distinctly below centre. Length, 5—6 mm.

A much smaller and stouter species than the preceding, at once known from them by the entirely flavous underside, metanotal structure, less cubical head and position of the nervellus. The discal colour of the abdomen is variable; usually only the sides are pale, sometimes the incisures are flavescent, and in the type form the third segment is entirely fulvous.

It occurs on oak in Germany during May, rarely about midsummer in Sweden, as well as in Belgium, Holland, and France. It was first bred by Prof. Gorski from *Allantus adumbratus* in 1848, according to Ratz.; subsequently Brischke raised it from larvae of *Selandria annulipes* and *Schizocera geminata*; and Dalla Torre credits Rondani with also breeding it from *Eriocampa limacina*, probably in Italy. "Taken in June in the vicinity of London" (Stephens, whose collection contains none). *P. Gorskii* was introduced as new to our fauna by Bridgman (Trans. Ent. Soc. 1882, p. 256) on the strength of examples bred by Fletcher, probably at Worcester, from *Phyllotoma vagans* and taken by himself at Norwich in July. It was also found at Lynn by Atmore; Bishops Teignton in Devon by Marshall; and I have a full series from Shere in Capron's collection, with one or two I took at Lyndhurst in the middle of July, 1909.

12. *pictilis*, Holmgr.

Perilissus pictilis, Holmgr. Sv. Ak. Handl. 1855, p. 125; Brisch. Phys. Ges. König. 1871, p. 71; Schr. Nat. Ges. Danz. 1878, p. 73, ♂ ♀; ? Voll. Pinac. xxxiii, fig. 6, ♂. *P. (Luphyroscopus) pictilis*, Thoms. O. E. ix. 915.

A little shining and finely punctate, with metanotal areola sulciform. Head with mouth, apical margin of clypeus, frontal and external orbits, and base of antennae flavidous. Thorax with mesonotal vittae nearly always, marks below wings and in ♂ the prothorax, flavous; metanotal areae distinct, with areola subsulciform. Abdomen black with all the segments apically, and the third sometimes entirely, testaceous or in ♀ rarely nearly entirely black; basal segment very finely punctulate, gradually dilated towards apex, with no or obsolete sulcus. Legs testaceous, with at most hind coxae basally black. Wings with tegulae flavous; nervellus intercepted at its centre. Length, 4—5 mm.

Very closely allied to *P. luteolator*, from which Thomson differentiates it by a somewhat distinct stigma in the lower wings, its shorter calcaria and black mesosternum.

Holmgren found it during September in Sweden; Brischke bred it in

Prussia from larvae of *Phyllotoma microcephala* and of a *Fenusa*, probably *F. pumilio*, on elm; and Gaulle records it from France, adding both *Entedecta pumila* and *Fenusa pygmaea* as hosts. It was introduced as British by Bridgman (Entom. 1880, p. 54) who took it at Norwich and tells us (Trans. Norf. Soc. 1894, p. 625) that it has been bred by Fletcher from *Phyllotoma melanopyga*, probably at Worcester.

13. minutus, Bridg.

Perilissus (Luphyroscopus) nigricollis, Thoms. O. E. ix. 915, ♂ ♀ (?). *P. minutus*, Bridg. Trans. Ent. Soc. 1887, p. 370, ♂ ♀.

A small but not slender black species with frontal orbits, mouth and legs flavo-stramineous; segments two to three or four narrowly red apically; ♂ face, cheeks, temples, pronotal marks and basal mesopleural line, stramineous. Length, $3\frac{1}{2}$ — $4\frac{1}{2}$ mm.

It is unnecessary to here repeat Bridgman's detailed description (*loc. cit.*) since this species differs so little from *P. luteolator* as to appear nothing but a small form of it, though sufficiently distinct in the black vertex and ♀ face, flavous ♂ scape, obsolete metanotal areae of which the petiolar carina alone is strong with areola hardly indicated and costulae wanting; parallel-sided petiole, not sulcate postpetiole, discally nearly entirely black abdomen, straight and slightly exerted black terebra; flavescent legs with their base stramineous and the hind coxae, except internally beneath, black; and the clear testaceous stigma.

Both sexes were originally described from examples, now in my collection and probably comprising the type, captured by Dr. Edward Capron in the neighbourhood of Shere in Surrey. It has not since been noticed, though it is very probable that synonymy with *P. nigricollis*, Thoms., will be established when the latter be again examined; but, as Bridgman truly says, his description is quite too short to render more than conjecture possible.

ECLYTUS, Holmgren.

Holmgr. Sv. Ak. Handl. 1855, p. 127.

Head buccate and tumidous, with the vertex broad and emarginate; mandibular teeth subequal in length. Antennae very slender and nearly as long as the body. Metathorax convex and apically gradually declived, with inconspicuous areae and the petiolar area minute. Abdomen oblong-subclavate, with ♀ anus compressed and the elongate hypopygium subinflated; terebra and ♂ styles somewhat exerted. Legs very slender with the hind tibiae stout and basally strongly constricted. Wings subample with (in our species) no areolet.

In the strongly buccate head and petiolate abdomen this genus can only be confused with *Perilissus*, from which the very much more nitidulous and less pubescent body, equally long mandibular teeth, very slender femora, central petiolar spiracles and lack of areolet will distinguish it.

Mesoleptus exornatus, Grav., was thought to belong here in spite of the presence of an areolet by Holmgren, incorporated by Thomson (O. E. ix. 916) and confirmed by Pfankuch. It was said to have been found near London by Stephens (Ill. M. vii. 215) but the single female in his collection is *Mesoleptus cingulatus* and, as no one else has noticed it, we cannot lay claim to it as indigenous. Ratzeburg tells us (Ichn. d. Forst.

ii. 118) that he bred it from *Nematus pini*, *N. abietum*, and *N. compressus* in the Hartz Mountains. Consequently we possess but the two kinds originally placed here by Holmgren in 1855, both of which, by a careless misreading of Vollenhoven's plate, Dalla Torre makes congeneric with our *Oedematopsis scabricula* (cf. Ichn. Brit. iii. 269).

Table of Species.

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| (2). | 1. | Scutellum and apices of all the abdominal segments flavous | .. | 1. ORNATUS, <i>Holmgr.</i> |
| (1). | 2. | Scutellum black; apices of only the anal segments flavous | .. .. | 2. FONTINALIS, <i>Holmgr.</i> |

1. ornatus, Holmgr.

Eclytus ornatus, Holmgr. Sv. Ak. Handl. 1855, p. 127, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 76, ♀; Voll. Pinac. pl. xxxii, figg. 2 et 3, ♂ ♂.

Head tumidulous, buccate and not posteriorly constricted; pale flavous with a large black ocellar mark; frons finely punctulate, face a little prominent and laterally depressed; clypeus arcuately impressed, hardly discreted, convex and apically subtruncate; mandibles subequal in length. Antennae nearly as long as body, very slender, infusate and paler beneath with scape flavidous. Thorax somewhat stout and black, with pronotum and whole sternum flavous; mesonotum convex and black with distinct notauli, two vittae and hamate lines before radix pale; pleurae closely punctulate, black and below flavous; areola elongate and subparallel-sided, petiolar area minute, shining and semicircular. Scutellum flavous. Abdomen narrow and subclavate; basal segment narrow, slightly dilated apically, with the petiole centrally arcuate and discally subsulcate; remainder of abdomen nitidulous with apical margin of segments more or less broadly flavous; second with distinct gastrocoeli; venter flavous with hypopygium convex, apically rounded and reaching nearly to apex of terebra. Legs very slender and testaceous, with anterior coxae and trochanters paler; hind coxae, femora and tibiae black-lined, their tarsi infusate and trochanters discally black-marked. Wings subample, with stigma testaceous, and nervellus intercepted below its centre. Length, 5—6 mm.

The ♂ rarely has the head and thorax mainly black, and both sexes may have the mesonotum and pleurae partly rufescent.

At present only known from sylvan places in Sweden, Prussia and France. It must be very rare with us and I have seen nothing like it. It was once bred from *Tortrix heparana* on 28th May, by Bignell in south Devon (Entom. 1880, p. 68); and once taken by Bridgman at Earlham near Norwich, in September. Marshall probably knew no more than the example recorded by him (Entom. 1872-3, p. 432) in "Ichneumonidae of the Isle of Man," captured there by Francis Walker during 1869; it is not in the former's collection.

2. fontinalis, Holmgr.

Eclytus fontinalis, Holmgr. Sv. Ak. Handl. 1855, p. 128; Brisch. Schr. Nat. Ges. Danz. 1892, p. 38, ♂ ♀; *lib. cit.* 1878, p. 76, ♂; Voll. Pinac. pl. xxxii, fig. 4, ♀.

A small black species with the mouth, clypeus, face, cheeks, prothoracic margin, apical margin of anal segments, venter and the anterior

coxae and trochanters, stramineous; legs rufescent with the hind tarsi, and sometimes their tibiae and coxae, nigrescent. Thorax distinctly narrower than the very broad head; areola sulciform and deeply impressed. Basal segment discally sulcate with the distinct petiole centrally broadly constricted; anus of ♀ distinctly compressed, with terebra straight and nearly as long as the basal segment. Hind tibiae basally constricted; nervellus opposite, hardly geniculate and intercepted at its lower fourth. Length, $4\frac{1}{2}$ — $5\frac{1}{2}$ mm.

Very distinct from the last in its black scutellum, smaller size, longer head with subquadrate vertex, much less profuse pale markings and peculiarly elongate terebra which, combined with its Lepidopterous host, allies it somewhat with *Oedematopsis*.

It is only known to occur in Sweden in September (Holmgren) and in Prussia, where it has been found upon hawthorn at the end of May, 1874 (Brischke). As British it was introduced by Bridgman (Trans. Ent. Soc. 1884, p. 433) and bred by Fletcher of Worthing from the Tortricid *Pædisca solandriana*; and from the same host by Bignell, who found it in Devon at Horrabridge and Radford in the middle of May, as well as at



Plym Bridge early in August. Bridgman subsequently took a variety on ling at Mousehold Heath near Norwich, with immaculate prothorax and prominent petiolar spiracles. It is not uncommon and I possess examples swept by Newbery at Ivybridge in Devon in August, 1905; by Wilson Saunders at Greenings in Surrey in June, 1871; both sexes by Capron at Shere; and a male by Piffard at Felden in Herts. On 13th September, 1910, I beat a female from a willow bush in the marshes at Walberswick on the Suffolk coast; and Stenton took it at Wimbledon towards the end of the preceding May.

SUB-TRIBE

CTENOPELMINI.*

This is a purely artificial division of the Tryphonides, into which has been thrust all those species with pectinate claws, a feature by which they may at once be known; but one that is by no means conspicuous, since in the majority of the groups here placed they combine the feature of peculiarly small claws, with the result that a microscope is at first necessary to determine their pectination among the smaller species. There is, however, great homology in the individual genera by means of which specimens are soon assigned without hesitation. Ashmead is, I believe, responsible for massing genera with pectinate claws into a sub-tribe; and, unfortunately, I was working with his "Classification" in our main divisions until it was almost impossible, without great labour and loss of more time than I could expend, to relegate each Ctenopelmid genus to its far more natural location among the Tryphonini and Meso-leptini. Thomson is by far the most scientific Ichneumonologist but he had the unhappy knack of presupposing everyone as enlightened as himself, with the result that his somewhat scattered system is by no means easy to work with until earlier authors become to some extent familiarised in one's mind. Thomson would never have thought—nor did the excellent Holmgren think—of erecting a rule of thumb, by accumulating into a group genera in every other way heterogeneous upon the single feature of pectinate claws.

* PHRUDUS, Bridgman.

Bridg. Trans. Ent. Soc. 1886, p. 361 (*nec* Först.).

Head subcubical, discally subquadrate with ocelli oblong. Clypeus apically rounded and basally discreted. Antennae filiform and hardly half length of body, with the flagellar joints distinctly discreted. Thorax stout and gibbulous, with notauli and sternali wanting; metathorax much shorter than high with complete areae and minute, circular spiracles. Scutellum hardly elevated. Abdomen petiolate, ovate and glabrous; basal segment sublinear and nearly parallel-sided, curved, thrice longer than apically broad, with central spiracles; second to seventh segments transverse and terebra a little shorter than half basal segment. Legs normal, not elongate with the front femora stout and tarsal claws pectinate. Areolet entire and pentagonal, stigma broad; discoidal cell sub-rectangular below and much longer than the brachial; cubital nervure of lower wings elongately pellucid basally.

Referring to this genus, Bridgman writes "In general appearance it is not unlike a small *Phygadeuon*, but the pectinated claws and the antennae clearly take it from this genus; the pectination of the claws is like that of the genus *Paniscus*, whilst the antennae are like those of *Thersilochus*, and, viewed sideways, it resembles the latter, but the shape of the head, form of the areolet, as well as the arrangement of the metathoracic costae, will prevent its being placed in this genus. Thomson thinks its proper place is in the *Tryphonidae*, and should come under his *Ctenopelmidae*; I am indebted to him for the suggested names;" the latter compares it with *Grypocentrus* and here appears lacking in his usual acumen, for there can be no shadow of doubt that the true position of the genus is in the *Stilpnidae*, from which we must not allow the gibbous and not declined throughout metathorax and the apically entire areola to separate it, for the structure of vertex, antennae, abdomen, legs except their onychii, and the shape of thorax are exactly as in *Stilpnus gagates*, next before which genus *Phrudus* should stand in our List.

1. *monilicornis*, Bridg.

Phrudus monilicornis, Bridg. Trans. Ent. Soc. 1886, p. 361; Thoms. O. E. xii. 1258, ♂ ♀.

A black and strongly nitidulous species, with only the legs and scape rufescent. Head shining and smooth; antennae not longer than head and thorax; flagellum with sixteen moniliform joints; scape ferrugineous. Thorax glabrous with no notauli; metanotum with five complete areae, of which the areola is triangular in ♀, hexagonal in ♂, and apically entire; petiolar area hexagonal. Basal segment linear and hardly explanate apically, nearly four times longer than broad, discally sulcate with obsolete spiracles; terebra exerted, about a third shorter than basal segment. Legs somewhat pale red with coxae black and the claws, rarely also all the femora, nigrescent. Wings ample; stigma and tegulae piceous; areolet subpentagonal, emitting recurrent nervure from its centre; nervellus not intercepted. Length, 3–4½ mm.

The type was taken by Dr. Capron at Shere in Surrey and is now in my collection with a dozen other examples from the same source; Thomson subsequently found it near Helsingborg in southern Sweden. I also possess one ♂, taken by Marshall at Lasingham in Yorks, and named by him *Polyrhembia tenebriosa*, (Grav.) Först. = ? *Atractodes vestalis*, Hal. (for remarks upon my queried synonymy of which at Ichn. Brit. ii. 246, cf. Roman, Nat. Unt. Sarek. 1909, p. 222). Marshall also found it at Nunton, Botusfleming, Cornworthy and Bugbrooke.

Table of Genera.

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| (8). | 1. Abdomen more or less distinctly petiolate; legs never stout. | |
| (5). | 2. Flagellum very stout throughout; claws elongately and closely pectinate. | |
| (4). | 3. Clypeal apex depressed and not produced; hind legs normal | CTENOPELMA, <i>Holmgr.</i> |
| (3). | 4. Clypeal apex centrally dentate; hind legs long and incrassate | SCOLOBATES, <i>Grav.</i> |
| (2). | 5. Flagellum normal; claws shortly and sparsely pectinate. | |
| (7). | 6. Head buccate; metanotal carinae distinct; clypeus not discreted | PRIONOPODA, <i>Holmgr.</i> |
| (6). | 7. Head normal; metanotal carinae wanting; clypeus discreted | LATHROLESTUS, <i>Thoms.</i> |
| (1). | 8. Abdomen distinctly sessile; legs very often short and stout. | |
| (10). | 9. Basal segments smooth; ♂ flagellum spatuliformly dilated | EUCEROS, <i>Grav.</i> |
| (9). | 10. Basal segments usually rugulose; flagellum not dilated. | |
| (14). | 11. Legs subelongate and somewhat slender; basal nervure suboblique. | |
| (13). | 12. Clypeus not discreted from face; ♀ not larviferous | MONORBLASTUS, <i>Htg.</i> |
| (12). | 13. Clypeus discreted from face; females larviferous | POLYBLASTUS, <i>Htg.</i> |
| (11). | 14. Legs distinctly short and stout; basal nervure subvertical. | |
| (16). | 15. Mandibular teeth subequal; antennal joints about thirty | ERROMENUS, <i>Holmgr.</i> |
| (15). | 16. Mandibular teeth unequal; antennal joints at most twenty. | |
| (18). | 17. Labrum not exerted; flagellum with at least seventeen joints | GRYPOCENTRUS, <i>Ruthe.</i> |
| (17). | 18. Labrum distinctly exerted; flagellum with about 12 joints | ADELOGNATHUS, <i>Holmgr.</i> |

CTENOPELMA, *Holmgren.*

Holmgr. Sv. Ak. Handl. 1855, p. 117.

Head transverse and hardly buccate, vertex emarginate; clypeus transverse and convex with its apical margin depressed, truncate or rounded; mandibular teeth stout and subequal in length; eyes entire and oblong-oval. Antennae filiform, distinctly stout and as long as body. Thorax stout, often with apical notauli; metathorax semiglobose with circular spiracles; areola and petiolar area often confluent. Scutellum a little elevated and often pale. Abdomen elongate subfusiform, shortly pilose and distinctly petiolate; basal segment convex, straight, constricted before the almost antemedial spiracles, with postpetiole gradually a little dilated to apex, and the discal sulcus usually distinct; second and third segments subequal in length; terebra stout and not concealed. Legs normal with hind femora subincrassate; tarsal claws very distinctly, usually elongately and coarsely pectinate. Areolet usually entire, radial cell lanceolate, nervellus intercepted above, in or below its centre.

This genus has a peculiar facies of its own in its stout and almost apically incrassate flagellum, peculiarly depressed clypeal apex, strongly combed claws and nitidulous body. Förster has, as usual, given a distinctive name, *Labroctonus*, to such species as possess no areolet; this is ignored by Dalla Torre in the case of *C. lapponica*, etc. Nor do I think the same author's *Rhorus*, differing solely in its non-discreted clypeus has a right to separate existence.

*Table of Species.**

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| (2). | 1. Clypeus hardly discreted; central segments laterally inflexed . . . | 1. MESOXANTHA, Grav. |
| (1). | 2. Clypeus strongly discreted; segments not inflexed. | |
| (4). | 3. Nervellus intercepted below centre; areola incomplete | 2. XANTHOSTIGMA, Hlgr. |
| (3). | 4. Nervellus intercepted above centre; areola complete | 3. NIGRA, Holmgr. |

1. *mesoxantha*, Grav.

Tryphon mesoxanthus, Gr. I. E. ii. 233, cf. i, Suppl. 692; Ste. Ill. M. vii. 248, ♂. *T. punctus*, Gr. I. E. ii. 326, cf. i, Suppl. 692; Stein, Ent. Nachr. 1892, p. 102; Kriech. l.c. p. 204, ♂ ♀. *T. scoticus*, Desv. Cat. 41, ♂. *Ctenopelma mesoxantha*, Holmgr. Sv. Ak. Handl. 1855, p. 117, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 71, ♀. *Rhorus mesoxanthus*, Kriech. Ent. Nachr. 1891, p. 247; cf. lib. cit. 1892, p. 203, ♂.

Somewhat dull, punctate and black with griseous pubescence. Head transverse and a little constricted posteriorly, with frons deplanate; face quadrate, in ♂ entirely and in ♀ with a large central mark, flavous; clypeus hardly discreted, laterally foveate and with palpi and ♂ mandibles flavous. Antennae as long as body, filiform with the twenty basal joints pale beneath. Thorax stout, as long as two basal segments and broad as head, punctate with notauli obsolete; mesosternum basally depressed and immarginate; metathoracic areae irregular, with areola minute. Abdomen double length of thorax, black, centrally pale; basal segment somewhat tumidulous, bicarinate, with spiracles subcentral; the third and basally impressed second segments red or flavous, parallel-sided and laterally subinflexed; following black. Legs slender with all the coxae, trochanters and, except the anterior partly, femora black; tibiae and tarsi flavidous, with the hind ones apically nigrescent. Wings subinfumate, stigma nigrescent, areolet irregularly triangular. Length, 13—15 mm.

This large species is recorded from Sweden; Germany, where Ratzeburg bred it from *Cimbex variabilis* (Ichn. d. Forst. iii. 123); and France,

* *Ctenopelma rufiventris*, Grav.

Mesoleptus rufiventris, Gr. I. E. ii. 90, ♀. *Tryphon involutor* Gr. l.c. 296; Ratz. Ichn. d. Forst. ii. 114, ♂ ♀. *Ctenopelma rufiventris*, Pfank. Zeits. Hym.-Dip. 1906, p. 31 et 1907, p. 147.

This species must be mentioned here since it was thought by Thomas Desvignes to be British, though no one was able to place it till Pfankuch recently examined the types, and Ratzeburg's record of it from *Lyda sylvatica* is doubtful. It is said to differ from other species of this genus in its testaceous abdomen, of which only the petiole is basally black; the ♂ has the inner orbits and centre of clypeus flavous, and both sexes have concolorous frontal spots; the antennae are subattenuate and mainly testaceous; thorax subnitidulous with five metanotal areae, areola apically incomplete; basal segment bicarinate, but not discally sulcate; the abdomen is sometimes castaneous (var. *involutor*) or with piceous spots; areolet small, elongately petiolate; nervellus opposite and ♂ valvula exerted. Desvignes' specimen, under this name, is referable to *Cteniscus limbatellus*.

where Gaulle adds *Trichiosoma betuleti* as an alternative host. It does not appear to have been noticed in Britain since Stephens, in 1835, said of it "Rare: taken in the New Forest, about the end of June"; and it must, consequently, be regarded with some suspicion as indigenous, were it not that I have been enabled to synonymise Desvignes' *T. Scoticus*, which he says (*l.c.*) was taken in Scotland, by an examination of the type, a fine insect of the maximum size, in the British Museum.

2. *xanthostigma*, Holmgr.

Ctenopelma xanthostigma, Holmgr. Sv. Handl. 1855, p. 118, ♂ ♀.

Somewhat shining, punctulate, pubescent and black with the mouth, clypeus and face entirely flavous; clypeus transversely convex, with the apical margin depressed and truncate. Antennae nearly entirely testaceous. Thorax black with tegulae, in ♂ also a line before them, whole of prothorax, mesosternum and metapleural marks, flavous; areola apically incomplete. Scutellum flavous. Abdomen pale red, with the basal segment and in ♀ anus black; central segments not laterally inflexed. Legs stramineous, with the hind tibiae and tarsi testaceous; hind femora and in ♀ all the coxae and trochanters black. Areolet subpetiolate; nervellus intercepted a little below its centre. Length, 7—8 mm.

The only known record of this species is Gyllenhal's capture of both sexes in West Gothland in southern Sweden, as instanced by Holmgren. But I possess two females so named, doubtless correctly, by Dr. Capron, which were captured by him, apparently about Shere in Surrey, some thirty years ago.

3. *nigra*, Holmgr.

Ctenopelma nigra, Holmgr. Sv. Ak. Handl. 1855, p. 120; Brisch. Phys. Ges. König. 1871, p. 69; Schr. Nat. Ges. Danz. 1878, p. 71, ♂.

Somewhat shining, punctate, black. Head hardly constricted posteriorly with mouth, clypeus, face except partly in ♂, and the ♀ vertical orbits, flavous. Antennae as long as body; of ♀ with flagellum dull ferrugineous, and scape flavidous, beneath. Thorax stout, with distinct notauli; pleurae glabrous; metathorax of ♂ subrugulose, of ♀ nearly smooth; metanotal areae distinct, with areola apically entire and laterally parallel. Abdomen not broad, longer than head and thorax, shining and black; of ♀ with the thyridii, and sides of third segment broadly, bright ferrugineous; basal segment stout, laterally impressed beyond its central spiracles, and in ♂ strongly sulcate discally. Legs pale red; anterior coxae and trochanters flavous; hind coxae, tarsi and apices of their tibiae, black. Wings with tegulae flavous; radial nervure slightly reflexed apically; nervellus intercepted distinctly above its centre. Length, 10—11 mm.

Boheman took a single ♂ in Lapland on 29th June and Brischke found the same sex at Königsberg. The female has not before been described, but I have no hesitation in here bringing forward, as such, a specimen I swept from birch bushes in the Bentley Woods near Ipswich on 20th May, 1902. This species and *C. lutea*, of which it may well be a colour variety on account of its glabrous frons, are the only ones known to me with supramedially intercepted nervellus.

SCOLOBATES, *Gravenhorst.*

Gr. I. E. ii (1829), 357; *Aglyphus*, Gir. Ann. Soc. Fr. 1871, p. 411.

Head transverse and buccate, deeply excavate posteriorly and vertically emarginate; clypeus subdiscreted and apically dentate centrally; eyes small and entire; mandibular teeth of subequal length. Antennae filiform, somewhat stout and distinctly longer than the body. Thorax nitidulous with the metanotum exareolate and its spiracles oval. Scutellum gibbulous. Abdomen subpetiolate, oblong-ovate with the basal segment gradually constricted basally, discally parallel-sided with spiracles but slightly before its centre; anus of ♀ subcompressed, terebra hardly exerted. Legs slender; the hind ones strongly elongate and stout with tarsi incrassate, claws coarsely pectinate and the inner double length of outer calcar. Areolet wanting.

The peculiarly stout hind legs and especially their tarsi, the laterally tumidulous head and elongate, thick antennae will distinguish this genus, so long regarded as belonging to the *Ophioninae* on account of its subcompressed ♀ anus, but nevertheless truly Tryphonidous, both on account of its structure and parasitism, for we must suppose Bouché's observation respecting a Lepidopterous host to be an error. The Rev. T. A. Marshall regarded (Trans. Ent. Soc. 1872, p. 264) both the species he placed in this genus (Cat. Brit. Hym. 1872, 65) as doubtfully indigenous. The following is now abundantly proved to be so; but *S. italicus*, Grav. (I. E. ii. 362, ♀), rests upon a single unlocalised example in Desvignes' collection, which Kriechbäumer (whose notes see at Ent. Nachr. 1877, p. 135) rightly refers to Förster's genus *Tachyporthus* (Zeits. Hym.-Dip. ii, 1901) and not the femoral-toothed *Aelometis*, as is done by Thomson, followed by Dalla Torre, at O. E. xix. 2034. It occurs in August and early September in France, Germany and a ♀ in Mus. Brit. was captured at Zante in the Ionian Isles during May, 1889. Kriechbäumer suggests that it may prey upon *Macrophya diversipes*, Schr.*

1. *auriculatus*, *Fab.*

Ichneumon auriculatus, Fab. Piez. 69. ♂. *Scolobates erassitarsus*, Gr I. E. ii. 360; Ste. Illus. M. vii. 269; Blanch. Hist. Ins. iii. 310; Fonsc. Ann. Soc. Fr. 1849, p. 237; Kriech. Ent. Nachr. 1877, p. 134; cf. Stein, loc. cit. 1880, p. 103; *S. auriculatus*, Ratz. Ichn. d. Forst. ii. 77; Holmgr. Sv. Ak. Handl. 1858, p. 154; Tasch. Hym. Deut. 74, ♂ ♀. *Prionopoda Canadensis*, Harr. Canad. Entom. 1892, p. 98, ♀; cf. Davis, Trans. Amer. Ent. Soc. 1897, p. 264.

A very smooth and nitidulous, black and red species. Head buccate, tumidulous and very smooth, with face sparsely punctate; mouth, face and the temples more or less broadly, fulvescent. Antennae longer than body, filiform, apically subattenuate and, at least beneath, rufescent;

* Since writing the above I have been delighted to find among some unnamed material a single pair of *T. italicus* which were captured by my friend Mr. F. W. L. Sladen, F.E.S., at sunset on 14th August, 1898, probably in company, at Ripple near Dover in Kent, and shortly afterwards kindly presented to me. This is the second Ichneumonid he has confirmed as indigenous (cf. Ichn. Brit. i. 5). The present insect is conspicuous among the *Tryphoninae* for its glittering red abdomen with the anus black and the ♀ apical segments white-banded, the curious feature of the anterior femora black and hind ones bright red, the hind tibiae and tarsi stout and totally black, the antennae in both sexes strongly setaceous and in ♀ centrally white-banded, the head immaculate black and the radices, though not tegulae, conspicuously large and pure white in both pairs of wings. It is excluded from *Scolobates* by its simple claws, and the gradual expansion from base to apex of the first segment places it in *Mesoleptides*.

scape obliquely truncate apically. Thorax gibbulous, very smooth and a little longer than high. Scutellum black. Abdomen centrally broadly red, as long as the head and thorax, deplanate or in ♀ convex and apically compressed; basal segment straight, flat, discally subparallel-sided with prominent spiracles; second subquadrate and the remainder transverse; second, third and in ♀ often part of fourth, red; apical incisures



pale; terebra very short and not extending beyond anus. Legs somewhat slender with the hind ones stout and elongate; all the claws distinctly pectinate; anterior legs red, basally black; hind ones black with the femora and base of their tibiae red. Wings slightly clouded with stigma infuscate and radix testaceous; internal and external radial nervures curved; nervellus opposite and strongly intercepted slightly below its centre. Length, 5—9 mm.

The size is variable, and the convexity of the abdomen differs in the sexes.

This species was originally described from Austria; Gravenhorst knew it from Germany and Tuscany, but nothing of its habits; it was first recorded from France by Blanchard, and as frequent in Sweden by Holmgren; recently its occurrence in Canada and the United States of America has been noted. In referring to Bouché's extremely doubtful breeding of a ♀ from the pupa of *Sphinx ocellata*, Ratzeburg says Erichson first synonymised the Fabrician and Gravenhorstian names in 1848. Bouché also found it to prey upon the sawfly, *Hylotoma pagana* and this is confirmed by Giraud's record of it (French Soc. 1877, p. 407) from *H. rosarum*, to which Gaulle adds *H. berberidis* and *H. enodis* (cf. also R. von Stein, Ent. Nach. vi, pp. 103—106).

It has been known as British since 1835, when Stephens says it had already been taken very rarely, in July and August, within the London district; the other species, referred to by Shuckard as indigenous, were certainly not cogenetic and Westwood knew none such in 1840. Few *Hylotomae* are common in Britain, which may account for this species'

apparent rarity. Bridgman took a single example at Brundall in Norfolk during June; I have seen a female from near Carlisle in 1900, in Routledge's collection, another from Kings Lynn, September, 1909, in Atmore's collection, and I possess three females and a single male. The latter is from Capron's collection, probably taken in Surrey; and of the former one was found at Folkestone, 25th August, 1907 (P. de la Garde), one about Brockenhurst in the New Forest, September, 1901 (W. G. Cross), and the last at Wimbledon Common, August, 1909 (Rupert Stenton, Entom. 1910, p. 38).

PRIONOPODA, *Holmgr.*

Holmgr. Sv. Ak. Handl. 1855, p. 120; *Priopoda*, Holmgr. *lib. cit.* 1854, p. 61.

Head a little transverse, subcubical and tumidulous; vertex subemarginate; clypeus not convex and hardly discreted; cheeks and mandibles stout, teeth of latter subequal in length; ocelli nearer each other than to orbits. Antennae filiform, elongate with scape ovate. Thorax with obsolete notauli; metanotum with indistinct but regular areae. Abdomen distinctly petiolate; basal segment deplanate, margined, basally constricted, with discal sulcus obsolete or wanting and its apex but slightly explanate, its spiracles distinctly a little before the centre; following segments broader than long; terebra shortly exerted. Legs normal with the tarsal claws shortly and sparsely pectinate. Wings subample with areolet entire.

This genus is known from the remainder of the Tryphonini by its buccate head, pectinate claws, antemedial petiolar spiracles and petiolate abdomen.

Table of Species.

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| (2). | 1. Flavidous; at most with vertex, thoracic marks and petiole black .. | 1. STICTICA, <i>Fab.</i> |
| (1). | 2. Black; at most with front of head, radical callosities and anus pale. | |
| (4). | 3. Frontal orbits flavous; hind legs mainly red | 2. XANTHOPSANA, <i>Grav.</i> |
| (3). | 4. Frontal orbits immaculate; hind legs mainly black | 3. GLABRA, <i>Bridg.</i> |

1. *stictica*, *Fab.*

Ichneumon sticticus, Fab. E. S. Suppl. 229; Gr. Nov. Act. Acad. 1818, p. 285. *Cryptus sticticus*, Fab. Piez. 89. *Mesoleptus sticticus*, Gr. I. E. ii. 31; i, Suppl. 682; Ste. Ill. M. vii. 216; Fonsc. Ann. Soc. Fr. 1849, p. 212, ♂ ♀. *Tryphon testaceus*, Zett. I. L. i. 387. *Prionopoda stictica*, Holmgr. Sv. Ak. Handl. 1855, p. 120; Voll. Pinac. pl. xxxi, ff. 6, 7; Brischke, Schr. Nat. Ges. Danz. 1878, p. 71; Thoms. O. E. ix. 912, ♂ ♀.

A fulvous or fulvo-testaceous species often with nothing but the ocelli and eyes black, sometimes with a vertical and thoracic marks, etc., black. Head fulvous with face and mouth paler, and mandibles apically black;

ocelli and a quadrate frontal mark concolorous or ferrugineous. Antennae filiform and slender, of ♂ a little longer than body and black with basal joints fulvous beneath, of ♀ length of body and mainly ferrugineous. Thorax gibbous and fulvous with pronotal and mesosternal marks black; metathorax alutaceous and longitudinally bicarinate. Scutellum and postscutellum flavous. Abdomen a little longer than head and thorax and oblong; basal segment very smooth and gradually a little dilated apically, with its basal end or two thirds black; remaining segments fulvous; terebra very short and black. Legs slender and fulvous with front coxae paler, hind tarsi and apices of their tibiae nigrescent. Wings subflavescent with stigma testaceous, radix and tegulae flavous; areolet irregularly triangular and subpetiolate. Length, 6—15 mm.

It varies in sometimes having the thorax nearly entirely black or mainly testaceous with scutellum paler; and is liable to be confused with *Mesoleptus testaceus* till the pectinate claws be noted.

On the Continent it occurs somewhat commonly in July and August upon umbelliferous flowers in France, Germany, Italy, throughout Scandinavia and has been bred in Prussia from larvae of *Tenthredo repanda* and of *Hylotoma ustulata* by Brischke, who describes its cocoon as cylindrical, dünnhäutig and brown with a flavidous central fascia. It is certainly rare with us; Hope took a female about Netley, Stephens records it from Hertford in July and Bridgman from Mousehold near Norwich in the same month; I possess two females taken about Shere by Capron, a male at Chatham by de la Garde in June, 1892, and another, which flew in to light on the dinner table at Monks' Soham at 9.0 p.m. on 25th August, 1907. Col. Nurse captured a female on 1st August, 1910, at Newmarket in Suffolk.

2. *xanthopsana*, Grav.

Mesoleptus xanthopsanus, Gr. I. E. ii. 59, ♂ ♀. *Priopoda xanthopsana*, Holmgr. Sv. Ak. Handl. 1854, p. 63, ♀. *Prionopoda xanthopsana*, Holmgr. lib. cit. 1855, p. 121; Voll. Pinac. pl. xxxi, fig. 8; cf. Thoms. O. E. ix. 912, ♂ ♀.

A black species with the mouth, face, frontal orbits and antennae apically flavidous, the abdomen centrally and most of legs red. Head anteriorly, with cheeks and frontal orbits, flavous. Antennae testaceous, of ♀ basally above and of ♂ mainly above infusate. Thorax with callosities at radix and sometimes prothorax partly testaceous; metanotal areae obsolete. Abdomen black, apically stouter in ♀; second segment of ♀ entirely pale red, of ♂ either nigrescent with the apex red or red with two black spots; third red and in ♂ often apically infusate; terebra very shortly exerted. Legs fulvidous with the anterior basally paler; hind ones with coxae and sometimes their femora more or less black. Wings subhyaline, stigma infusate, tegulae testaceous; areolet irregularly triangular and subpetiolate. Length, 6—8 mm.

It is said to occur in grassy places in June and August, and is recorded from Breslau, Silesia, Sweden and France. It is difficult to suppose Bridgman's species to be synonymous with the present and, if Vollenhoven's lively figure be correctly named, they are very distinct. It is curious, however, that no one has noticed this species in Britain since it was first introduced by Marshall in 1870, I know not upon what authority, since it is not in his collection.

3. *glabra*, Bridg.

Prionopoda glaber, Bridg. Trans. Ent. Soc. 1886, p. 360, ♂ ♀.

A stout, pubescent, subcylindrical, black species with only the abdomen except basally and anterior legs red; ♀ face and clypeus flavous. Head as broad as thorax; clypeus apically rounded; face griseous-pilose and punctate, of ♂ immaculate, of ♀ entirely with clypeus and palpi flavous. Antennae as long as body with flagellum fulvous beneath, darker in ♂. Thorax with obsolete notauli and subglabrous mesonotum, mesopleurae punctate; metanotal areae distinct, costulae wanting; areola elongate, centrally subexplanate and usually apically entire; petiolar area longitudinally carinate centrally. Scutellum hardly convex. Abdomen nearly cylindrical, nitidulous and red with basal segment and often base of second black, anus often infusate or nigrescent. Hind legs black with apices of trochanters and sometimes base of tibiae testaceous; anterior legs testaceous with coxae, trochanters and usually base of femora black. Wings slightly clouded, stigma nigrescent, tegulae stramineous or piceous; areolet petiolate, obliquely subcircular with its outer nervure pellucid below; nervellus intercepted one-third from its apex. Length, 7—10 mm.

Superficially extremely like a *Tryphon*, with which it doubtless used to be mixed, but with the tarsi pectinate and abdomen basally narrower. Marshall referred this species, in his collection to *Tryphon nigripes*, Holmgr., and some such synonymy may be anticipated.

Bridgman took the typical sexes at Norwich at the end of July, 1879, which is the latest known English date. It has only occurred to me from 14th June to 27th July, almost always upon the flowers of *Heracleum sphondylium*, where it invariably puts in an appearance on the coast cliffs at Southwold and Covehithe. I have, however, also swept it from willow at Barton Mills, from oak in Staverton Thicks, and taken it both in the centre of Ipswich, and on the windy downs behind Brighton. It is a common species, though not yet recognised on the Continent, and has been found by Marshall at Nunton, by Elliott at Heacham in Norfolk in July, and at Birnam in Perth on 20th July, 1907, by Piffard at Felden and by Capron commonly at Shere in Surrey.

LATHROLESTUS, Thomson.

Thoms. O. E. ix. 911 et 916; (?) *Lathrolestes*, Först. Verh. pr. Rheinl. 1868, p. 196.

Size small. Vertex never transcarinate before occiput, often centrally elevated; clypeus discreted. Antennae as long as body, pilose, with the scape short, nearly transverse and the pedicellus large; flagellum not centrally dilated. Metathorax with at most the petiolar area entire; mesopleurae shining, smooth and very finely alutaceous. Abdomen sessile; first segment deplanate, broad, somewhat short and basally subcarinate; second segment transverse; terebra arcuate, generally somewhat long and stout. Tarsi not incrassate, their claws pectinate. Stigma broad; basal nervure arcuately vertical and the radial basally curved.

This small genus was utilised by Thomson for the reception of Holm-

gren's single species of *Perilissus* and *Grypocentrus*, which possessed pectinated claws, and appears divisible from the latter solely by its petiolate basal segment.

Table of Species.

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| (6). | 1. | Petiolar area entire and not extending beyond centre of metathorax. | |
| (5). | 2. | Vertex immarginate; anus entirely black. | |
| (4). | 3. | Metanotal areae wanting; head flavous, only discally black .. | 1. MACROPYGUS, <i>Holmgr.</i> |
| (3). | 4. | Metanotal areae entire; head black, orbits narrowly pale | 2. BIPUNCTATUS, <i>Bridg.</i> |
| (2). | 5. | Vertex centrally margined; anus entirely testaceous | 3. MARGINATUS, <i>Thoms.</i> |
| (1). | 6. | Petiolar area basally wanting and extending beyond centre | 4. UNGULARIS, <i>Thoms.</i> |

1. *macropygus*, *Holmgr.*

Perilissus macropygus, Holmgr. Sv. Ak. Handl. 1855, p. 126; Brisch. Phys. Ges. König. 1871, p. 71, ♂; Schr. Nat. Ges. Danz. 1878, p. 73, ♂ ♀. *P. solcatus*, Holmgr. Sv. Ak. Handl. 1855, p. 126, ♀. *Lathrolestus macropygus*, Thoms. O. E. ix. 917, ♂ ♀.

♂. Shining, very finely punctate and black with the mouth, clypeus, face, cheeks and apex of frons, flavous. Head a little constricted posteriorly, flavous with only the occiput to centre of frons black; mandibular teeth unequal; clypeus not deeply discreted. Antennae as long as body and infusate, pale with the scape entirely flavous beneath. Thorax laterally flavous, with hamate lines before radices and often apical mesonotal vittae concolorous; sternum pale with a central black mark; metanotal areae wanting. Scutellum flavous, more rarely entirely black. Abdomen black with a basal red fascia on third and fourth segments; the following shining and laterally pale; basal segment not broad; venter flavous, ventral valvulae large, exserted and pale. Anterior legs, with hind coxae and trochanters, flavidous; hind ones testaceous with tarsi subinfusate. Stigma infusate, tegulae flavous; nervellus intercepted below centre.

♀. Structure of ♂, but the head posteriorly broader; hypopygium retracted from the slightly reflexed terebra. Black with only mouth, antennae basally beneath, tegulae, trochanters and apices of coxae, pale flavous; legs flavidous with coxae basally black; hind tarsi, apices of their tibiae and of anterior tarsi, infusate. Length, 5—6 mm.

It occurs in France, Sweden and both sexes were bred together in Prussia from larvae of *Fenusa betulae* and *Blennocampa tenella* by Brischke; Cameron adds also from *B. melanocephala*. "This handsome little insect has been taken by Mr. Champion at Aviemore," says Bridgman (Trans. Ent. Soc. 1887, p. 373), adding that it "has since been taken by Dr. Capron in the neighbourhood of Shere"; I possess the latter specimens, three males, together with a single pair, found by Piffard at Felden in Herts; Stanley Edwards captured a female at Ivybridge in Devon during 1891; and I swept another, with many eggs or larvae at its anus, on 18th June, 1901, in an osier carr by the River Lark at Barton Mills, Suffolk.

2. *bipunctatus*, Bridg.

Grypocentrus bipunctatus, Bridg. Trans. Ent. Soc. 1886, p. 358, ♀.

Head dull and distinctly a little constricted behind eyes with the mouth, mandibles, most of clypeus, the juxta-antennal orbits and a dot at the vertex, fulvous; face transverse and centrally prominent; clypeus deeply discreted, apically depressed and subtruncate. Antennae as long as body, infusate and beneath basally fulvous. Thorax somewhat dull, very finely punctate with distinct notauli and nitidulous mesopleurae; metanotum dull and finely punctate, areae and costulae entire but indistinct, areola pentagonal and longer than broad. Scutellum convex. Abdomen ovate, nitidulous, dull piceous throughout with white, sparse pubescence and transverse segments; basal segment petiolate, spiracles just beyond centre; postpetiole gradually explanate throughout, its apex fully thrice broader than base; terebra reflexed and slightly exserted. Legs normal, fulvous; coxae, except apices of front ones, black; hind femora, with apices of their tibiae and of their tarsi, nigrescent. Wings with tegulae flavous, stigma pale infusate and areolet sessile; nervellus intercepted below centre. Length, $3\frac{1}{4}$ mm. ♀ only.

Sufficiently distinct in the capital markings and petiolate abdomen, which appears to relegate it to the genus *Lathrolestus*, Thoms.

It was described from a single female, doubtless still in Bridgman's collection in the Norwich Castle Museum, which was taken at Wimbledon in Surrey during July, 1880. Subsequently its author found this species at Earlham in Norfolk, in June. The sole representative of *Tryphon nanus*, Grav. (which, Pfankuch finds, is synonymous with *Hemiteles fulvipes* and not an *Adelognathus*, under which genus it has for so long stood in our list) in Stephens' collection is referable to the present species, with the frontal and occipital fulvous marks very distinct and by no means conformable with his description which is copied from Grav.; he says (Ill. Man. vii. 237) that it was taken in July, 1835, at Hertford.

3. *marginatus*, Thoms.

Lathrolestus marginatus, Thoms. O. E. ix. 917 et xix. 1982, ♂ ♀.

Black, head and thorax flavous-marked, vertex margined and frenal scrobes distinct. Length, 5 mm.

To his meagre diagnosis Thomson adds that it differs from his *L. caudatus* (which, in turn, differs from *L. macropygus* in its entirely black abdomen and distinctly exserted terebra) in the vertex being obviously margined centrally, the mouth with clypeus and cheeks broadly, a small juxta-antennal mark and a large one at the vertex orbits, the antennae beneath and the legs flavous, with coxae except basally and trochanters whitish, the areolet sessile, abdomen testaceous with the first segment entirely and the second and third basally broadly black, the terebra stout, somewhat elongate and less curved. He adds that the ♀ of *L. marginatus* varies in having the areolet apically incomplete and the ♂ in having the mouth, face, cheeks very broadly, with nearly whole of pronotum and mesosternum, stramineous.

Bridgman records this species (Trans. Norf. Soc. v, p. 627) from Mousehold Heath near Norwich, with no note of its novelty as British, in 1894.

4. *angularis*, Thoms.*Lathrolestus angularis*, Thoms. O. E. ix. 918, ♂ ♀.

An obsoletely punctate and very strongly nitidulous species, with convex and black abdomen. Head black, with the vertex centrally margined: ♂ with face, cheeks, temples, pro- and meso-notal marks, usually stramineous. Antennae slender, extending to centre of abdomen. Metathorax with a subarcuate transverse costa before its centre; petiolar area elongate, basally explanate, extending beyond centre of metathorax and basally incomplete. Abdomen immaculate and strongly convex; basal segment petiolate, scabrous, broad with very strongly prominent spiracles. Legs flavous with the tarsi stramineous, their apical joint and the hind coxae alone black, and claws strongly pectinate. Length, 3—4 mm.



The elongate petiolar area is peculiar to this species and the prominent petiolar spiracles remarkable.

It was first introduced under the queried name *Grypocentrus rhytiatus*, Zett. et Hlmgr., and was taken close to Norwich on 9th June, 1878, by Bridgman (Trans. Ent. Soc. 1882, p. 158): but his error was corrected by Thomson (*ib. cit.* 1885, p. 300), to whom he sent the specimen. Elsewhere it is only known from Sweden, though I have constantly found it an abundant species in Suffolk: I first met with it upon pine as early as 26th April, 1897, and have taken it annually, often in considerable numbers, upon birch bushes from six to eight feet in height from 16th May to 16th of June only, both in the Bentley Woods and Assington Thicks near Sudbury; I have been unable to ascertain its host, which is doubtless some common birch-feeding *Nematus* or *Pimpla nigritans*, Klug. Bignell has given me a male from the Plymouth district; and Stenton takes it commonly from June to August at Wimbledon in Surrey.

EUCEROS, *Gravenhorst*.

Gr. I. E. iii (1829), 368 ; *Eumesius*, Westw. Introd. ii (1840), Synop. 59.

Head buccate and transverse; eyes oval and subprominent; clypeus broadly discreted; lower mandibular tooth the shorter. Antennae a little shorter than the body; of ♀ simple, of ♂ centrally dilated and compressed with joints 11—17 much broader than the remainder. Thorax gibbulous. Scutellum subconvex, triangular and apically obtuse. Abdomen entirely sessile and subdeplanate, as broad as thorax with basal segment subquadrate and but slightly narrowed basally, remainder transverse; incisures deeply impressed; terebra not exerted. Legs somewhat slender; hind tarsi not explanate; tarsal claws pectinate. Wings subample with no areolet; radius emitted before centre of the somewhat narrow stigma; nervellus intercepted below its centre.

This genus was founded by both Gravenhorst and Westwood on the centrally explanate ♂ flagellum, and the wanting areolet, to which the latter added the deeply impressed segmental incisures. The males are extremely distinct, but the females are not very easily recognised by their sessile abdomen, simple though pectinate tarsi, and quite concealed terebra. It was placed by its author under his supergenus *Bassus*, which differed from our *Tryphonides* in its completely sessile abdomen, and the parasitism of the genus appears to warrant some such distinction from the majority of its group, in pertaining to the Lepidoptera. Many interesting details are given in Wesmael's "Note sur les caractères des *Euceros*, Grav. (sous-genre d'Ichneumonides)" (Bull. Ac. Brux. 1841, p. 360). It is a small genus of some fourteen species, most of which are American; five are palaearctic, and of these three or four are known as British.

Table of Species.

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| (4). | 1. Body slender; abdomen centrally white-banded. | |
| (3). | 2. Areola wanting; metapleurae and hind coxae black | 1. CRASSICORNIS, <i>Grav.</i> |
| (2). | 3. Areola entire; metapleurae and hind coxae red | 2. SERRICORNIS, <i>Hal.</i> |
| (1). | 4. Body stout; abdomen not centrally white-banded. | |
| (6). | 5. Hind femora and abdomen black; scutellum basally white | 3. UNIFASCIATUS, <i>Voll.</i> |
| (5). | 6. Femora and abdomen, except basally, red; scutellum black | 4. ALBITARSUS, <i>Curt.</i> |

1. crassicornis, *Grav.*

Euceros crassicornis, Gr. I. E. iii. 370, ♂; Shuck. Burm. Man., frontisp., fig. 2; Curt. B. E. 660; Blanch. Hist. Ins. iii. 321; Holmgr. Sv. Ak. Handl. 1855, p. 385, ♂ ♀; cf. Verhoeff, Ent. Nachr. 1892, p. 4. *E. morionellus*, Holmgr. Sv. Ak. Handl. 1855, p. 201, ♀. *E. pruinus*, DT. Wien. Ent. Zeit. 1890, p. 139, ♀ (? nec Grav.).

A shining, black and white- or flavous-marked species, not at all red. Head of ♂ flavous with the eyes, vertex and occiput black; of ♀ black with the mouth partly, a central facial mark and another on either side

near the scrobes, sometimes also behind the eyes, flavous; frons punctulate and slightly impressed on either side. Antennae of ♂ infusate with the ten basal joints red beneath and six following, excepting black lateral dots, flavous; of ♀ infusate throughout, but paler beneath. Thorax stout and black with humeral marks, callosities beneath radices, the pleural suture and in ♂ mesonotal vittae, whitish; areola obsolete, petiolar area subsemicircular. Scutellum black with its sides, apex and a postscutellar mark, whitish. Abdomen deplanate, black with the incisures of ♂ whitish, of ♀ testaceous. Anterior legs fulvescent with coxae and trochanters of ♂ whitish, of ♀ infusate; hind ones nigrescent with apices of coxae and of trochanters, and the tibial base above, whitish. Wings very slightly clouded, with stigma infusate; radix and tegulae white. Length, 5—8 mm.



This species is instantly known from the next, which it much resembles, by the lack of a hind tarsal white band and metanotal areola.

The original male was from Dresden; subsequently Wesmael found it in Belgium, and Holmgren says both sexes occurred rarely in Sweden, in the middle of July, 1857; it was bred by Brischke (Schr. Nat. Ges. Danz. 1878, p. 95) from larvae of *Cidaria berberaria* in Prussia, and by Giraud (Ann. Soc. Fr. 1877, p. 407) from *Thecla quercus*. The first British specimen is that in his collection, figured by Shuckard (Burm. Transl. 1836, p. 633); Curtis possessed a male, believed to have been taken at Birch Wood, though authenticated by Westwood (Mod. Class. ii. 153) to have been "reared by the late Mr. Blunt from *Achatea piniperda*"; Marshall saw both sexes (E.M.M. 1876, p. 195) taken at Kingussie (*l.c.* p. 228) by Cameron. The Rev. F. D. Morice has given me a male taken by him on a rose tree in Chitty's garden on 7th June, 1902, at Huntingfield, near Faversham in Kent; and Mr. G. T. Lyle a bred male of the minimum size, raised in the New Forest from larvae of *Eupithecia abbreviata* on 29th July, 1908; this specimen had emerged from a lateral hole near one end

of a cocoon of its own manufacture, cylindrical, of equal breadth at both extremities, somewhat shining, very dark brown and strongly resembling those of the Pimplid genus *Lissonota*, with no distinct girdle; it was in its cocoon about fourteen days.

2. *serricornis*, Hal.

† *Euceros serricornis*, Hal. Ann. Nat. Hist. 1839, p. 117, ♂ ♀. *E. grandicornis*, Holmgr. Sv. Ak. Handl. 1855, p. 200, ♂. *E. egregius*, Holmgr. lib. cit. p. 201, ♂ ♀, excl. var.; Voll. Pinac. pl. xxxiii, fig. 8; cf. Kriech. Ent. Nachr. 1888, p. 198. *Bassus peronatus*, Marsh. E. M. M. xii, p. 194; Morl. Trans. Ent. Soc. 1905, p. 438, ♀.

A shining, white-marked species, with the hind tarsi white-banded and only the metathorax laterally red. Head and thorax white-marked; ♂ face and orbits broadly white, with flagellar joints apically produced and the 9th—12th strongly explanate. Metanotal areola entire and triangular. Abdomen with four centrally interrupted pale bands. Legs pale with the hind coxae and femora red, their tarsi nigrescent and centrally white-banded. Length, 7—8 mm.

Extremely like the preceding but with the areola entire, the hind tarsi centrally pale and the metapleurae nearly always broadly testaceous. No doubt can remain respecting the synonymy of Haliday's species with that of Holmgren; that it has not hitherto been noted is entirely owing to the neglect with which the former's Ichneumonidae have been treated on the Continent, and lack of students at home. Why Dalla Torre places *E. serricornis* in the Pimplid genus *Acrodactylus* I fail to understand.

Both sexes were originally described from examples taken during June in Wicklow, Ireland. It is said by Holmgren to be very rare, early in September, in Sweden; and Gaulle has recently recorded it from France. It was brought forward as English by Dr. Edward Capron (Entom. 1880, p. 87) on the strength of a single female, taken near Guildford in Surrey during the preceding year; he subsequently took a second and both are now in my collection. The only other example I have seen was swept by Mr. Ernest Elliott on 20th August, 1907, from herbage on the banks of the river Tay at Birnam in Perth.

That *Bassus peronatus* does not belong to that genus, I was at once able to ascertain by its simply bidentate mandibles upon examining the type, labelled "*Nematus nanus*, Cam., bred July, 1874" by Cameron, from whom it was acquired by the British Museum in 1898; but its true position was much more difficult to come at. I have no doubt, however, that it belongs to the present genus, where the rufescent mesosternum, etc., renders it most closely allied to this species, of which I consider it a variety. Marshall says (*loc. cit.*) that it was bred from the larvae of *Nematus cadderensis*, found (*l.c.* p. 128) feeding on birch in Cadder Wilderness.

3. *unifasciatus*, Voll.

Eucerus unifasciatus, Voll. Tijds. v. Ent. 1878, p. 159, ♀.

Black, somewhat dull, with dense and very short griseous pubescence. Head with the palpi, facial orbits and a large dot at the outer orbits, flavous. Always two dots on the basal carinae of the scutellum, often its apex transversely, nearly always the apex of postscutellum and occasionally two short lines on front of mesonotum, flavous; metanotum trans-

carinate, but with no areola. Abdomen stout and broader than thorax, entirely black, or with all the incisures very narrowly testaceous, or (form typ.) with the basal segment alone apically white banded, except centrally; venter basally ochreous; terebra not exerted, ♂ valvulae recurved. Legs pale fulvous with the anterior coxae and trochanters black or badious; hind legs black and stout, with only extreme apices of femora and extreme base of tibiae castaneous; claws small and pectinate. Wings hyaline with radix and tegulae flavous, stigma piceous; nervellus subopposite and intercepted distinctly below its centre. Length, 7—10 mm. ♂ ♀.

The ♂, which has not before been described, differs only in the centrally explanate antennae and flavescent mandibles. Vollenhoven says he knew four Dutch females and had seen what he thought to be another in Holmgren's collection from Sweden, under that author's name *E. morionellus*, synonymised by himself "certissime" with Gravenhorst's species and differing from the present only in its central facial and ante-radical markings. I possess examples with and without mesonotal and apical scutellar marks.

This species, which is entirely distinct from *E. serricornis*, in spite of its author's remarks (Pinac. 53), was brought forward as British, but unnamed, by Dr. Capron in his "Notes on Hymenoptera" (Entom. 1880, p. 87) from the neighbourhood of Guildford in Surrey, where he took a single female in 1879; this, with three others from his collection, I now possess. The unique male was captured by me in woods at Haven Street in the Isle of Wight on 28th June, 1907, and is in my collection.

4. albitarsus, Curt.

Euceros albitarsus, Curt. B. E. pl. dclx; Voll. Pinac. pl. xxxiii, fig. 7, ♂; Gir. Verh. z.-b. Ges. 1857, p. 166, pl. iii, figg. 2, 3, ♂ ♀; cf. Bignell, E. M. M. 1897, p. 158 et Wesm. Bull. Ac. Brux. 1841, p. 362.

Shining, black, very densely and somewhat finely punctate, and shortly pubescent. Head buccate and black with the inner orbits, a mark at the outer and another on the cheeks, stramineous; ♂ also with whole mouth, face, cheeks and a small frontal mark concolorous. Antennae of ♂ very strongly compressed and explanate centrally, and externally fulvous from centre to near base; of ♀ infusate and centrally compressed, though not explanate. Thorax with distinct notauli, of ♀ immaculate, of ♂ with a dot before the subhamate and concolorous line before radices, a line below them and a mesopleural mark, stramineous; metathorax very short, strongly punctate and transcarinate with no areola. Scutellum black. Abdomen stout, bright red, and broader in ♀; with the quadrate and centrally subcarinate basal segment, except apically, alone black and its spiracles far before the centre; remaining segments strongly transverse with incisures deeply impressed, rarely discally black dotted. Legs red and somewhat stout; coxae and trochanters black, the former in ♂ externally flavous-marked; hind tarsi black with the claws fulvous and in ♂ joints two to four pure white. Wings a little clouded apically; tegulae black, in ♂ white-marked. Length, 7—13 mm.

Curtis' "magnificent novelty" still remains extremely rare; he knew but a single male in 1837, taken off dock in May or June on the borders of a wood, near Milton in Northants; Vollenhoven does not tell us whence came the male he erroneously terms *E. crassicornis* in Pinac.;

Desvignes possessed one very large female in 1856, and both sexes were described in Austria in 1857. Nothing was subsequently heard of this very conspicuous species till 1897, when Bignell chanced upon "An Assemblage of parasitic Hymenoptera in Devonshire" (E.M.M. 1897, p. 158) and took twenty-three specimens, comprising both sexes on May 5th, 8th and 11th, sitting beneath the leaves of a newly expanded beech in an oak coppice in Bickleigh Woods, near Plymouth. My description is drawn from Curtis and both sexes then taken and given me by Bignell, who adds "when I obtained these I also got several larvae of *Asteroscopus sphinx*, each with seven to nine white eggs on the surface of the skin; I had an idea that these might produce *E. albitarsus*, but, unfortunately, they shed their skins about four days after, removing the eggs in the operation." The concealed ovipositor suggests that the eggs would be laid on, not under, the hosts' skin; and the cogenetic species are known to prey on Lepidoptera. Gaulle records it also from France.

MONOBLASTUS, Hartig.

Htg. Wieg. Arch. 1837, p. 155.

Head transverse, generally subtumidous, with face hardly convex; clypeus not discreted, foveate and not pilose on either side; mandibular teeth of subequal length. Antennae about as long as body, filiform, with the basal flagellar joint longer than the second. Thorax stout, metathorax short, with discal areae distinct. Abdomen subsessile, oblong-subfusiform and broadly red; first segment gradually constricted basally, bicarinate; terebra short, hardly exerted and not oviferous. Legs normal, not elongate, with the tarsal claws at least basally pectinate. Wings ample, with areolet entire and subpetiolate.

The right of this genus to an existence apart from *Polyblastus* is best founded, I think, upon the non-larviferous habit of the females, since the mere discretion of the clypeus from the face by a transverse sulcus, in which it structurally alone differs therefrom, is insufficient for generic distinction. Holmgren thought its species preyed upon Lepidopterous larvae, but Brischke and Stenton have disproved this by raising many from those of Tenthredinidae. They are apt to be confused with the smaller species of *Tryphon*, which they strongly resemble in the shape of the head and abdomen, though the pectination of the claws, especially the front ones, is sufficiently obvious. The abdomen is more slender than in most *Polyblasti*, and the antennae longer.

Table of Species.

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| (6). | 1. Basal segment short, not twice longer than apically broad. | |
| (5). | 2. Scutellum and anterior coxae black. | |
| (4). | 3. Costulae obsolete; face only apically flavous | 1. NEUSTRIAE, <i>Schr.</i> |
| (3). | 4. Costulae strong; face nearly entirely flavous | 2. PALUSTRIS, <i>Holmgr.</i> |
| (2). | 5. Scutellum and anterior coxae flavous | 3. EXSTIRPATORIUS, <i>Grav.</i> |
| (1). | 6. Basal segment elongate, fully twice longer than apically broad. | |
| (8). | 7. Metanotal costae weak; all femora mainly black | 4. CHRYSOPUS, <i>Gmel.</i> |
| (7). | 8. Metanotal costae strong; all femora usually red | 5. LONGICORNIS, <i>Holmgr.</i> |

1. *neustriæ*, Schr.

Ichneumon neustriæ, Schr. F. B. ii. 304; Bechstein, Forstins. 145 et 499, ♂ ♀. *Tryphon neustriæ*, Ratz. Ichn. d. Forst. ii. 115, ♂. *Monoblastus neustriæ*, Brisch. Phys. Ges. König. 1871, p. 90; Schr. Nat. Ges. Danz. 1878, p. 96, ♂ ♀. *Polyblastus femoralis*, Holmgr. Sv. Ak. Handl. 1855, p. 203, ♂ ♀.

Slightly shining, punctate and black with the mouth pale. Head transverse, not constricted posteriorly, punctate and black; frons apically subimpressed on either side; face longitudinally subelevated centrally, punctate and rarely black, usually flavous-marked above the undiscreted and apically rounded, black or flavous clypeus; mandibles testaceous, apically darker, with the teeth of subequal length; palpi dull testaceous. Antennæ stout and a little shorter than the body, black with the flagellum dull ferrugineous beneath. Thorax stout, punctate, shortly pubescent and nearly as broad as the head; mesonotum convex, with notauli obsolete; pleuræ punctate; metathorax rugose, with five not very distinct discal areae. Scutellum normally convex and punctate. Abdomen hardly longer than head and thorax; basal segment finely rugose, margined and black, with carinae extending beyond its centre and the intervening space concave; second subalutaceous, transverse and apically broadly rufescent; third red, often with black marks, alutaceous with its apex smoother; ♀ anus testaceous; terebra short, stout and pale. Legs pale red with only coxæ and trochanters black, the hind tarsi often infusate and all femora stout. Wings slightly clouded, radix testaceous, stigma infusate and basally paler, areolet subpetiolate, radial nervure nearly straight; nervellus intercepted below its centre. Length, 6—7 mm.

A stouter and more distinctly punctulate species than *M. extirpatorius*, and at once known from it by the always entirely black scutellum.

It is frequent in marshy places in southern Lapland, and Brischke has bred it in Prussia from larvae of *Nematus citreus* (= *Pteronus melanaspis*), though Ratzeburg's record of it as bred from *Bombyx Neustria* on 17th May, 1838, is doubtless an error. Gaulle records it from France and van Burgst from Holland, but with us it would appear uncommon, though there is a full series from Shere in Capron's collection; one from Cornworthy in Devon (Marshall coll.), two from Peckham, near London (Tr. Ent. Soc. 1882, p. 158), Miss Chawner has given it me from the New Forest and Bridgman records it doubtfully from Brundall, near Norwich.

2. *palustris*, Holmgr.

Polyblastus palustris, Holmgr. Sv. Ak. Handl. 1855, p. 203, ♂ ♀. *Monoblastus palustris*, Holmgr. lib. cit. 1856, p. 386; Brisch. Phys. Ges. König. 1871, p. 90; Schr. Nat. Ges. Danz. 1878, p. 96, ♂ ♀. *Tryphon subfasciatus*, Ste. Ill. Mand. vii. 251, ♀.

Shining, punctulate, pubescent and black with the mouth, clypeus, nearly the whole face and the tegulae flavidous; second segment apically and the legs testaceous or fulvidous with the coxæ, base of trochanters, hind tarsi and apices of both their femora and tibiae nigrescent. Metanotum with five distinct areae, of which the areola is subrectangular. Two basal segments very finely rugose, the first subconstricted towards its base with distinct carinae. Length, 6 mm.

This species is probably no more than a colour variety of *M. exstirpatorius*, from which its author says it differs only in its immaculate black scutellum and darker front coxae. The legs, however, are very variable and Holmgren gives four forms showing the hind femora may be more or less broadly infusate or, with their tibiae, entirely rufescent, as also may be their tarsi, and the anterior femora are sometimes basally black, combined with the third segment almost entirely testaceous. Closely allied structurally to *Erromenus brunnicans* and superficially similar in colour, but with face pale and clypeus not discreted.

"The *M. palustris* larva was cylindrical, the head and first segment and the two apical segments quite white, the intervening space being green from the interior parts of the creature showing through the skin. There was a very dark green line, bordered by white granules along the dorsal area, throughout the length of the green part, lateral lines, ventro-lateral lines showing only in the segmental divisions, and a dark ventral line. I counted fourteen segments, including the cephalic one. There was a very slightly discreted border, not very evident. The mouth parts were discreted with fuscous and the antennal tubercles large, concolorous, and not protruding beyond the level of the head."

It is said to be not infrequent in marshy places in Sweden and southern Lapland; and Brischke has bred it in Prussia from the sawflies, *Nematus cirrhopus*, *N. gracilis*, *Selandria hyalina* (*Blennocampa assimilis*) and—Dalla Torre ascribes to him—*Dineura verna*. It occurs in France and was introduced as British by Marshall in 1872 on the strength of a single specimen in his collection from Bugbrooke in Northampton; there is another there from Nunton, in the British Museum, with the two females referred to by Stephens, as having been "found in June, near London."

All these I have examined; together with those concerning the economy of which Mr. Stenton has given so admirable an account and figure (Entom. 1911, p. 87):—A female was observed on 10th June, 1910, to oviposit in a larva of *Emphytus cinctus* at Herne Hill near London and, on being confined in a box, was supplied with further larvae of the same species of sawfly, upon which it almost instantly laid eggs close behind the head; the oviposition occupied but a few seconds and the host in this case made no resistance, though the usual practice is to violently throw themselves from side to side when attacked, sometimes falling to the ground with the parasite attached to their bodies; at least four host-larvae were parasitised by each ichneumon daily. From the sawfly larva attacked on 10th June that of the parasite emerged on 27th July following, leaving nothing but the shrivelled skin. The larva then spun silken strands (probably part of an artificially aborted cocoon) and on 1st August signs of pupation were manifest, completed on 2nd; the pupa gradually deepened in colouration from 19th to 25th August, on which morning an active male was emerged. In all five females were captured in the same locality, where it was conjectured to be not uncommon in gardens by Mr. Stenton, whose description of the larva I have given above *in extenso*, as probably typical of ichneumonidous Tenthredinid parasites in general.

3. *extirpatorius*, Grav.

Tryphon extirpatorius, Gr. I. E. ii. 213; Drewsen, Wieg. Arch. 1836, p. 37; Fonsc. Ann. Soc. Fr. 1849, p. 224, ♂ ♀. (?) *Cteniscus extirpatorius*, Brisch. Schr. Phys. Ges. Königl. 1871, p. 98; Schr. Nat. Ges. Danz. 1878, p. 106 (*nec* Holmgr.). *Polyblastus laevigatus*, Holmgr. Sv. Ak. Handl. 1854, p. 75; *lib. cit.* 1855, p. 203, ♂ ♀. *Monoblastus laevigatus*, Holmgr. l.c. 1856, p. 385; Brisch. Schr. Nat. Ges. Danz. 1878, p. 95, ♂ ♀.

Head with the mouth and, except sometimes centrally, the face flavous. Antennae of ♀ with flagellum broadly testaceous beneath; of ♂ entirely black. Thorax immaculate, metanotal costae strong; scutellum apically and usually the ♀ postscutellum flavous. Abdomen oblong-ovate and sessile; second to fourth segments except sometimes two discal black dots, apex of the first and sometimes base of fifth and sixth red; seventh of ♂ whitish, of ♀ fulvous with the very short terebra concolorous. Legs normal and red; anterior coxae and trochanters testaceous or stramineous, the latter basally black; hind coxae basally or mainly black. Wings with the areolet irregular and subpetiolate, its outer nervure often weak; radix and tegulae flavous. Length, 6—7 mm.

Our commonest and most unmistakable species, since it is the only one with pale scutellum. It is found in Sweden and France and has been bred from *Emphytus rufocinctus* according to Cameron (i. 273), in Germany by Brischke from *Micronematus pullus*, *Pontania proxima* and *Pteronius miliaris*, according to Gaulle. Introduced by Bridgman (Entom. 1880, p. 54) upon his taking three specimens near Norwich in 1879; he adds later that J. Fletcher of Worcester bred it from *Eriocampa ovata*. There is a full series from Surrey in Dr. Capron's collection; I have taken it at Horning and Wroxham Broad in Norfolk in the middle of June, on *Heracleum* flowers on the Southwold cliffs in July, and upon those of *Angelica* in the New Forest in August.

4. *chrysopus*, Gmel.

Ichneumon chrysopus, Gmel. S. N. i. 2702. *Tryphon chrysopus*, Grav. I. E. ii. 302, ♀ (*sic* ♂). *Monoblastus Caproni*, Bridg. Trans. Ent. Soc. 1882, p. 159, ♂. *M. chrysopus*, Pfank. Zeits. Hym. Dip. 1907, p. 148, ♂ ♀.

A black species with the face, mouth except a circular clypeal spot, cheeks, anterior coxae and trochanters, flavous; anus and discal marks on second segments, with all femora broadly and hind tibiae mainly, black. Length, $6\frac{1}{2}$ —9 mm.

This species is extremely like *M. longicornis*, with which I at first synonymised it and am able now to differentiate it by nothing but the colour of the cheeks, femora and second segment; Pfankuch, however, was satisfied respecting their distinctness, and compares the present more particularly with *M. extirpatorius*, from which he says it may be known by its flavous cheeks and front of head which bears but a single black clypeal spot, the scutellum is black, mesopleurae almost rugosely punctate, metanotal costae weak and costulae wanting, basal segment almost as long as in *M. longicornis*, second with two often coalesced black dots on its disc, anus black with terebral sheaths pale.

Bridgman's species is obviously synonymous, and the type is in my collection with a full series of both sexes, taken in Surrey by Capron thirty years ago; elsewhere it has been only recognised in Germany. I

do not know how this species came to be included in our former catalogues, unless on account of three males in Desvignes' collection; no earlier record is available than the description of Bridgman, who subsequently himself found the species at Earlham, near Norwich.

5. *longicornis*, Holmgr.

Monoblastus longicornis, Holmgr. Sv. Ak. Handl. 1856, p. 387; Brisch. Phys. Ges. König. 1871, p. 91; Schr. Nat. Ges. Danz. 1878, p. 96; Thoms. O. E. ix. 903; Kriech. Progr. Gymn. Pola, 1894, p. 18, ♂ ♀.

Somewhat shining, punctulate and black. Head subtumidous and hardly constricted posteriorly; frons deplanate and subremotely punctate, centrally subsulcate; face punctate, pubescent and not elevated, flavous or in ♂ usually black; clypeus not centrally discreted, subrugose, a little convex centrally, black and often pale-marked; cheeks of ♂ not flavous. Antennae slightly longer than body, filiform and piceous with flagellum infusate ferrugineous, often testaceous beneath. Thorax longer than high; mesonotum sparsely punctulate with obsolete notauli; pleurae punctate; metathorax shining and obsoletely punctate with five very distinct areae, of which the areola is rectangular and twice longer than broad. Scutellum black and convex. Abdomen somewhat longer than head and thorax, red with the first segment black and the fifth to seventh sometimes infusate; basal segment subelongate, basally a little narrowed, shining, pubescent and apically subdiluted, with very fine carinae extending beyond its centre; second quadrate and not black-marked; venter flavous, terebra very short and pilose. Legs normal and red with coxae and most of trochanters black; hind tarsi apically hardly infusate with all femora red; anterior tibiae externally flavous; tarsal claws, especially anterior, distinctly pectinate. Wings subample; stigma infusate, radix and tegulae flavous; areolet petiolate and entire, emitting recurrent nervure from its apex; radial nervure apically subreflexed; nervellus intercepted below its centre. Length, 7—8 mm.

Recognised by the distinct griseous pilosity of head and thorax, the elongate basal segment and centrally subdiluted epicnemium. Holmgren originally described the ♂ face as black, and the femora as immaculate red; Bridgman's male *M. Caproni* differs in little but its pale face and cheeks, and the mainly black femora; I have a certainly co-specific ♀, named *M. longicornis* by Dr. Brauns, with black femora and should have synonymised it with this species had not Pfankuch considered the latter distinct from *M. chrysopus* in 1907.

Southern Sweden and Prussia, etc., widely distributed on the Continent, extending to Holland and France. It has not before been noted in Britain, and I can instance but a single example, captured by myself by sweeping long grass on the bank of the River Alde at Farnham in Suffolk on 24th July, 1899.

POLYBLASTUS, Hartig.

Htg. Wieg. Arch. 1837, p. 155.

Head subtransverse and generally tumidulous with the vertex broad, emarginate and discreted from occiput by carina; face subquadrate, longitudinally elevated centrally and usually pilose; clypeus convex and deeply

discreted with its lateral foveae not tomentose, and the apical margin both ciliate and slightly reflexed; mandibles short and broad with the teeth subequal in length. Antennae not short, about as long as body; of ♂ not centrally dilated. Thorax gibbous; metathorax short and semi-globose with the discal areae entire, obsolete or wanting. Abdomen not petiolate, hardly longer than head and thorax; first segment usually a little contracted gradually towards its base, with distinct discal carinae; terebra subexserted, stout and larviferous. Legs slender; hind tarsi not incrassate; claws basally strongly, apically much more weakly, pectinate, in ♂ occasionally submutic. Wings broad and not long; areolet petiolate and nearly always more or less entire.

The genus *Scorpiorus*, Först., differs from the present in nothing but its lack of areolet and has a most improbable right to distinction; Thomson uses the name for species of the present genus with complete areolet, and relegates to it such as have the abdomen centrally red and the unguinal pectination unusually weak. Other species of *Polyblastus* have been curiously and quite unwarrantably distributed by Dalla Torre, who obviously followed authors and not generic characters in compiling his very excellent and generally accurate Catalogus of 1901.

Fourteen species were placed under the present genus in our 1872 Catalogue, of which *P. impressus* is now known to belong to the Tryphonini, *P. haemosternus*, Hal., is omitted as insufficiently described, *Bassus rufiventris* was misplaced here, and four more are synonymised. To the remaining seven kinds I was enabled to add nine in 1901, of which two belong to other genera. This total of fourteen is here increased to eighteen species, but even so shadows of no less than seven more are before me, recorded in MS. by Marshall; these I have not examined and exclude till they may be more satisfactorily placed upon our List. The genus has been very little worked and much synonymy is sure to accrue, since Holmgren's material was often scanty.

The genus is celebrated as the only one in which the females carry their extruded eggs or larvae attached to the venter, as was especially noted by all the earlier authors to Stephens and Fonscolombe. Westwood well sums up what was known upon the subject in 1840 (Introd. ii. 146); he says, "Gravenhorst first noticed (Ichn. Eur. ii. 151 et 222) that the females of various species were furnished near the extremity of the abdomen on the underside with a variable number of small pear-shaped or oviform vesicle-like bodies of a white or straw colour, being more obtuse and darker-coloured at the tips, of which he says 'ova esse videntur'. Subsequently Haliday communicated to Curtis specimens of the latter insect (*P. variitarsus*) 'with a sketch of the larvae, for such they are, and not eggs' (cf. *P. cothurnatus*, post) 'in different stages'; and he found as many as eighteen of them attached to one insect: 'at first they are all smooth, pear-shaped, and of a shining opaque waxy tint, but in a few days they appear different; at this stage its voracious powers develop themselves, and I find the oldest generally making a meal of his next neighbour, who is soon sucked to the skin. I observed two motions of the mouth, one an opening and shutting of the mandibles, the other a general dilatation and contraction of the membrane of the mouth. Beyond this they show little signs of life while attached to the oviduct, but on being removed, which is easily done without injuring them, the darker ones have a slight jerking motion.' The observations of De Geer enable us to judge of the true nature of these bodies" (?) "respecting which

Curtis (B.E. 399) has made some remarks." "All the females I have seen have had these nits attached to them; each appears to me to be an animal contained in a bladder which has a peduncle at the lower end, by which it is attached to the base of the oviduct; they are there nourished, but whether the animal ever leaves the sac I am not able to determine: I think it probable since I found that the bladders attached to the upper side of the abdomen of the female *Dyticus marginalis* contained an *Hydrachna*," which is not an analogous case for, whatever their economy, the present are certainly the offspring of their host. Westwood also is at fault when he proceeds, "It is evident that the insect, probably in the agony of death" (as first suggested by Gravenhorst), "had extruded its already developed and impregnated eggs, without being able to place them in their true locality, whence they remained attached to the abdomen of the parent," but the evidence goes to prove that these corpuscles are always larvae, with the assumption that the eggs are gestated within the female abdomen, like so many of the Diptera. Dr. Hartig also published a Memoir upon the pedunculated eggs of various Ichneumonidae (Wieg. Arch. iii, tab. 4) exhibiting the abdomen of his undescribed *Polyblastus cancer*, bearing a very great number of eggs attached to its extremity beneath, and *P. caudatus* in the act of depositing a pedunculated egg. But scant attention appears to have been since paid the subject, which is biologically most fascinating. Little doubt can remain that the extrusion of the eggs or larvae is perfectly normal, for the great majority of the females captured bear such clusters which Fonscolombe, even in 1849, considered to be true eggs; and the subject is referred to, though no species are mentioned, by Rev. J. G. Wood in *Insects at Home*, p. 322. Quite possibly, in order to avoid individual death through the superabundance of their hosts' vitality, whole broods of these parasites are deposited at once upon the Tenthredinid host larva, and are, as Curtis occultly pronounces, nourished by the female until they arrive at a sufficiently vigorous condition to render them immune from such a contingency; but I fail to find any reference to this effect yet published.

Table of Species.

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| (2). | 1. Antennae white-banded; legs short and stout | 1. ANNULICORNIS, <i>Gir.</i> |
| (1). | 2. Antennae not white-banded; legs usually subelongate. | |
| (34). | 3. Scutellum not pyramidal, at most simply convex. | |
| (5). | 4. Apical hind tarsal joint thrice longer than penultimate | 2. PARVULUS, <i>Grav.</i> |
| (4). | 5. Apical hind tarsal joint hardly double penultimate. | |
| (23). | 6. Centre of abdomen mainly red, or hind tarsi white-banded. | |
| (8). | 7. Scutellum and mesonotal vittae bright flavous | 3. BRIDGMANI, <i>Parf.</i> |
| (7). | 8. Scutellum and mesonotum immaculate black. | |
| (20). | 9. Areolet entire or subentire. | |
| (11). | 10. Hind legs entirely black; abdomen obscurely red | 4. UNICINCTUS, <i>Bridg.</i> |

- (10). 11. Hind legs not entirely black; abdomen paler.
- (19). 12. Anus always black; hind femora usually red.
- (16). 13. Basal segment narrow and elongate; tarsi usually banded.
- (15). 14. Wings subinfumate; hind tibiae always white-banded 5. VARIITARSUS, *Grav.*
- (14). 15. Wings deep piceous; hind tibiae entirely black 6. COTHURNATUS, *Grav.*
- (13). 16. Basal segment broad, not elongate; tarsi not banded.
- (18). 17. Vertex quadrate; 1st segment laterally straight 7. SPHAEROCEPHALUS, *Gr.*
- (17). 18. Vertex and 1st segment both distinctly rounded 8. PASTORALIS, *Grav.*
- (12). 19. Anus rarely black; hind femora always partly black 9. PRATENSIS, *Grav.*
- (9). 20. Areolet wanting.
- (22). 21. Scutellum at most basally margined 10. RIVALIS, *Holmgr.*
- (21). 22. Scutellum strongly margined right round its apex 11. MARGINATUS, *Holmgr.*
- (6). 23. Abdomen black; hind tarsi not white-banded.
- (27). 24. Metanotal areae wanting or strongly obsolete.
- (26). 25. Stigma flavidous; segments convex, incisures deep 12. PINGUIS, *Grav.*
- (25). 26. Stigma black; abdomen uniformly subdeplanate 13. WESTRINGI, *Holmgr.*
- (24). 27. Metanotal areae entire and very distinct.
- (33). 28. Areolet entire; basal segment usually scabriculous.
- (30). 29. Ungual pectination strong; mesothorax red 14. SANGUINATORIUS, *Rtz.*
- (29). 30. Ungual pectination normal; thorax black.
- (32). 31. Hind tibiae and centre of smooth abdomen testaceous 15. WAHLBERGI, *Holmgr.*
- (31). 32. Hind tibiae white-banded; abdomen black, scabriculous 16. SUBALPINUS, *Holmgr.*
- (28). 33. Areolet wanting; abdomen nitidulous throughout 17. MELANOSTIGMUS, *Hlgr.*
- (3). 34. Scutellum very strongly elevated, subpyramidal.
- (36). 35. Petiolar spiracles simple; costulae entire 18. PYRAMIDATUS, *Holmgr.*
- (35). 36. Petiolar spiracles dentiform; costulae wanting 19. BIDENTATUS, *Steph.*

1. annulicornis, *Gir.*

Polyblastus annulicornis, Giraud, Ann. Soc. Fr. 1871, p. 406, ♀. *P. grossus*, Brisch. Schr. Phys. Ges. König. 1871, p. 94, ♂; Schr. Nat. Ges. Danz. 1878, p. 100, ♂.

A short and stout species, black and shining, hardly punctulate and but little pubescent. Head transverse and not constricted posteriorly; mouth, clypeus, the subquadrate face and cheeks whitish; clypeus convex, apically rounded and basally discreted; mandibles stout and curved, with the

teeth of equal length. Antennae stout and two-thirds length of body, with flagellum centrally white-banded and scape piceous beneath. Thorax with notauli obsolete; metanotum shining, with areola subquadrate and apically a little explanate. Scutellum large, subpyramidal and apically truncate. Abdomen stout and black, hardly longer than head and thorax, with all the segments testaceous-margined; basal segment rugulose, curved, strongly bicarinate nearly to its apex and but very slightly constricted basally, with spiracles obsolete and a little ante-central; second segment rugulose and transversely impressed, the following smooth and shining; venter rufescent; terebra stout, straight and distinctly a little exserted. Legs short and stout, the anterior with hind coxae and trochanters testaceous; remainder of hind legs piceous; tarsal claws stout and pectinate. Wings subhyaline with nervures nigrescent, radix and tegulae clear testaceous, stigma basally pale; areolet subpetiolate and somewhat regularly triangular. Length, 10 mm.

The short legs and stout abdomen lend it much the appearance of *Erromenus*.

This entirely distinct species, described from Lower Austria by Dr. Giraud who took but a single female at Prater near Vienna in the middle of September, is recorded by Rev. T. A. Marshall (E.M.M. 1897, p. 150) from Botusfleming in Cornwall, "I find it here occasionally in hedges; it varies much in size; no ♂ has yet occurred." There are two specimens thence in his collection in the British Museum. In his own copy of the 1872 Catalogue, which I possess, he has doubtless correctly entered it as synonymous with *P. grossus*, which Brischke took at Königsberg, thus linking up the above records.

2. *parvulus*, Grav.

Tryphon parvulus, Gr. I. E. ii. 294; Ste. Ill. M. vii. 260, ♂. *Polyblastus infestus*, Holmgr. Sv. Ak. Handl. 1855, p. 204; Brisch. Schr. Nat. Ges. Danz. 1878, p. 97, ♀.

♂. Black. Antennae stramineous beneath, with the scape entirely black. Abdomen with segments two to four, and disc of fifth, red. Anterior legs fulvous, with the coxae at least basally black; hind legs black; with apices of coxae and of trochanters stramineous, tibiae testaceous and their apices and tarsi nigrescent. Wings slightly infumate with stigma and radius infusate piceous, radix and tegulae stramineous; areolet wanting. Length, 5 mm.

♀. Somewhat shining, finely punctate and black with the mouth and two apical facial marks flavous, abdomen centrally and the anterior legs red. Clypeus slightly deplanate before its apex; antennae shorter than body, pale ferrugineous and paler beneath, with the two basal joints black, flavous beneath. Metathorax semiglobose with distinct upper areae. Scutellum not pyramidal. Basal segment margined, subrugose, basally a little convex, gradually dilated towards its deplanate apex, with distinct carinae; segments two to four and apex of first red, sixth apically whitish; terebra slightly exserted, black and pilose. Anterior legs fulvous with the coxae, trochanters and intermediate femora black; hind legs black with their tibiae, except apically, rufescent; apical joint of hind tarsi three or four times longer than the penultimate. Nervellus intercepted below its centre. Length, 6 mm.

Brischke says the colouration of the ♀ legs is variable.

In Marshall's own copy of *Ichn. Europ.*, which I possess, he has termed this species a *Polyblastus* (I do not know upon what grounds) and places it in that genus in his Catalogues as the ♂ of *P. infestus*, Holmgr., unknown to the latter author. Gravenhorst says his ♂ is similar in conformation and outline to *Trematopygus procurator*, though without areolet. Pfankuch indicates the types of both *T. parvulus* and *T. humilis*, to which it is also compared, as lost; and Dalla Torre considers *P. infestus* to be distinct, as probably did Marshall later, since his ♂ from "Lampert" is not placed with his females from Nunton in Wilts in his collection.

Manger found two ♂♂ in Silesia; Boheman took the typical ♀ in Lapland and Brischke records the same sex from Prussia. "Taken in June near Hertford" (Stephens); our only subsequent records are from Marshall, given above.

3. *Bridgmani*, Parfitt.

Polyblastus Bridgmani, Parf. E. M. M. xviii (1882), p. 251.

Closely and finely punctate, pubescent and black with the mouth, face, scape beneath, mesonotal vittae and scutellum, flavous; legs and centre of abdomen fulvaceous. Antennae longer than body. Thorax gibbous and black with two raised lines extending from the anterior radices convergently to the scutellum, a line before a dot before radices and a callosity below the latter, flavous; metathorax coarsely punctate and pubescent with the areola subentire. Scutellum and postscutellum entirely flavous. Abdomen deplanate, subparallel-sided and apically obtuse; basal segment discally sulcate; segments three and four entirely, the second apically and thyridii, fulvous. Legs fulvous with anterior coxae and trochanters paler; base of femora narrowly nigrescent; hind tarsi and apical half of their femora black. Stigma and radix black, tegulae flavous; nervellus intercepted below its centre. Length, $6\frac{1}{2}$ mm.

There is little beyond colouration in Parfitt's description and no one has since noticed this species which, if relegated to its correct genus, is remarkably distinct in its pale scutellum and mesonotal vittae. He is a little vague as to the colouration of the two basal segments, and as to whether it be the hind femora or tibiae which are apically black. No sex is indicated; Dalla Torre terms it ♀, which is improbable since the antennae are unusually elongate, the abdomen narrow and no terebra is referred to.

Its author adds "I captured this species in a field of wheat near Exeter, in July, 1881, and have named it, as a slight mark of esteem and appreciation of the work done in this neglected group of British insects, the Ichneumonidae, by Mr. J. B. Bridgman, of Norwich."

4. *unicinctus*, Bridg.

Polyblastus unicinctus, Bridg. Trans. Ent. Soc. 1889, p. 433, ♀.

Shining and smooth, finely white-pubescent and black with the mandibles flavous, second segment castaneous, and the anterior legs mainly red. Antennae about as long as the body. Metanotum short, with three areae. Scutellum not elevated. Basal segment discally subsulcate, double length of its apical breadth which is one-half broader than its basal; second segment castaneous and, like the following, transverse; terebra exerted,

straight and black. Legs slender and black, only the anterior femora red with their tibiae and the front tarsi paler; basal half of tarsal claws distinctly pectinate. Areolet sessile, emitting recurrent nervure but slightly before its apex; stigma and tegulae piceous; radial nervure apically straight; nervellus intercepted but slightly below its centre. Length, 7 mm. ♂ unknown.

Bridgman's description is poor and he mentions no allied species; it appears to me to be little more than an intermediate form with the black hind femora and abdominal colouration of *P. variitarsus*, var. *Stenhammari*, combined with the immaculate hind tarsi and tibiae of *P. cothurnatus*.

"Taken by the Rev. T. A. Marshall in south Devonshire," though not recorded thence by Bignell.

5. *variitarsus*, Grav.

Tryphon varitarsus, Gr. I. E. ii. 222; i. 688; Curt. B. E. pl. cccxcix; Ste. Ill. M. vii. 247, ♂ ♀. *Polyblastus varitarsus*, Htg. Wieg. Arch. 1837, p. 155; Schiöd. Guér. Mag. 1839, p. 17; Nat. Tidskr. 1847, p. 98; Holmgr. Sv. Ak. Handl. 1854, p. 71; *lib. cit.* 1855, p. 204, pl. viii, fig. 15; Brisch. Schr. Nat. Ges. Danz. 1878, p. 97; Davis, Trans. Amer. Ent. Soc. 1897, p. 263, ♂ ♀. Var. *Tryphon albovinctus*, Gr. I. E. ii. 224; Ste. Ill. M. vii. 247; *Polyblastus albovinctus*, Htg. Wieg. Arch. 1837, p. 155, ♀. *P. Stenhammari*, Holmgr. Sv. Ak. Handl. 1855, p. 205, ♂ ♀.

A shining and pubescent species, black with the abdomen centrally, anterior legs mainly and hind femora, red; hind legs white-banded: Clypeus subimpressed before its apex; face with white pilosity; mouth flavous. Antennae as long as body and apically piceous beneath. Metathorax somewhat short with five distinct areae. Scutellum not pyramidal. Basal segment distinctly constricted basally, and laterally depressed, with distinct carinae extending beyond its centre; second and third segments transverse and red, ♀ with fourth and ♂ often with apex of first concolorous; terebra very shortly exerted, oviferous and black. Legs black with all the femora, the anterior tibiae and tarsi, red; hind legs slender with the black tibiae and tarsi broadly white-banded; apical joint of hind tarsi hardly double length of penultimate. Areolet entire, irregular and subpetiolate; apical abscissa of radial nervure centrally curved; radix flavidous; nervellus intercepted hardly below its centre. Length, 4—8½ mm.

It is at once recognised by the distinct hind pedal colouration and narrow petiole.

Authors appear to have overlooked Hartig's inclusion of *T. albovinctus* in this genus so early as 1837, since Brischke first considered it a variety of this species, though Marshall four years earlier had left it in its original genus, and this is confirmed by Pfankuch from the type specimens (*cf.* also Bridg. Trans. Ent. Soc. 1882, p. 158). This variety appears to differ in nothing but the lack of pale hind tarsal band and the often duller one on the hind tibiae; it seems to form a link connecting this species with *P. cothurnatus*, to which I am inclined to grudge specific rank. *P. Stenhammari* has not been mentioned since first described by Holmgren, who says it has the structure of *P. variitarsus* and there is nothing in his description to justify specific rank; the scape beneath with the anterior trochanters and most of their coxae are flavous, the central segments are usually darker, and the hind femora are black. I possess specimens with black hind femora and broadly red abdomen, and consider them to be

synonymous. I have a small female of less than 5 mm. with only the incisures of the 2nd and 3rd segments obscurely rufescent.

This species occurs throughout probably the whole palaearctic region and is recorded from the Continent in grassy places on umbells from May to July; Davis (*l.c.*) says it has also been found in Montana, Colorado and Nevada. In Britain it is by far the commonest of a somewhat rare genus and I have constantly taken it by sweeping in marshes, sometimes after dusk; it is abroad from 26th May to 7th October and about midsummer may frequently be seen sucking the flower-tables of *Heracleum sphondylium*, later resorting to those of *Angelica sylvestris*, upon which it continues to occur as long as any flower remains alive in the autumn, though it is not known to hibernate. Our first record is of those sent by Hope to Gravenhorst from Netley in Shropshire in 1829; in 1832 Haliday wrote (Curt. B. E. fol. 399) that they "occur in August and September on Willows and Ragwort" in Ireland. Stephens, in whose collection is a male labelled "*strobilicella*," considered it not very uncommon near London and in the New Forest; and I have records from Nunton in Wilts and Cornworthy (Marshall coll.); common at Glanvilles Wootton (Dale); common in Norfolk (Bridg.); Plymouth and Bickleigh (Bignell); Shere (Capron); Felden in Herts (Piffard); Guestling near Hastings (Bloomfield); Kings Lynn (Atmore); Hunstanton and Heacham in Norfolk (Elliott). It has occurred to me at Parkhurst Forest, Isle of Wight, at Kirtling and Chippenham Fen in Cambs., at Denny Wood and Matley Bog in New Forest; and in Suffolk at Ipswich, Henstead, Claydon, Barnby Broad, Foxhall, Tuddenham Fen, Farnham, Nacton, Barton Mills, Brandon. The var. *Stenhammari* has only been recorded from Sweden; there are two in coll. Marshall from Bishops Teignton and Freshwater in Isle of Wight on 9th June; and Bridgman says Atmore took a doubtful individual at Lynn in Norfolk.

6. cothurnatus, Grav.

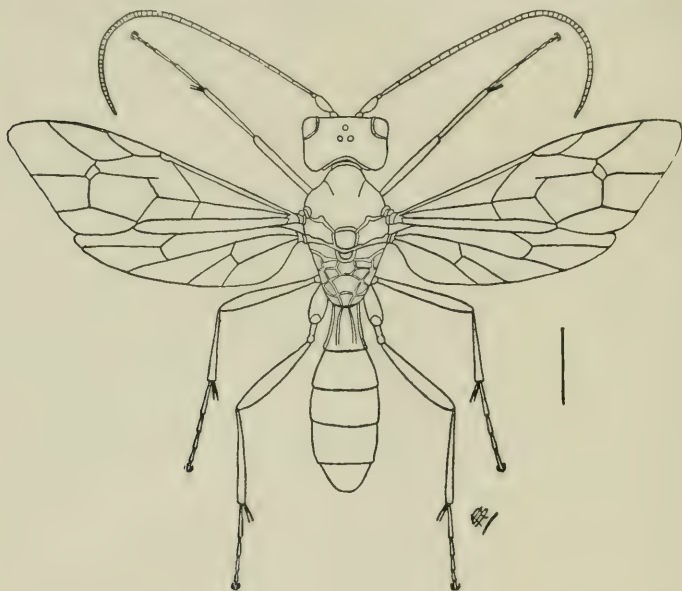
Tryphon cothurnatus, Gr. I. E. ii. 285, ♀. *Polyblastus Drewseni*, Schiöd. Guér. Mag. 1839, p. 15, pl. viii, fig. 1, ♀; Nat. Tidskr. 1847, p. 98. *P. cothurnatus*, Holmgr. Sv. Ak. Handl. 1854, p. 74; *lib. cit.* 1855, p. 205; Brisch. Phys. Ges. König. 1871, p. 92; Schr. Nat. Ges. Danz. 1878, p. 97, ♀.

A shining, pubescent, black species with the mouth, antennae apically beneath, centre of abdomen, femora and anterior tibiae and their tarsi, red. Clypeus impressed before its apex; face with griseous pilosity. Metathorax somewhat short, with five very distinct upper areae; petiolar area large, subvertical and transversely rugose. Scutellum not pyramidal. Basal segment not petiolate, margined, with distinct carinae; second and third segments transverse and red, with apex of first often concolorous; terebra short, black and subexserted. Hind legs slender and black with only their femora, from base nearly to apex, red; apical joint of hind tarsi hardly double length of penultimate. Areolet irregularly subpetiolate; stigma and tegulae nigrescent, radix stramineous; radial nervure apically nearly straight; nervellus intercepted in its centre. Length, 7—8 mm. ♂ unknown.

This species is similar to *P. variitarsus*, especially in the structure of the basal segment, but differs in its tumidous head, stouter thorax and entirely black hind tibiae and tarsi. Pfankuch tells us that the type is

lost. I hardly consider it distinct and the following are differentiated solely on the entirely black hind tibiae and tarsi.

Gravenhorst knew two females taken in Silesia and during May near Breslau; Schiödt records it from Denmark; Holmgren says it occurs in Sweden in July, and in Lapland; Brischke found it in Prussia; Van Burgst in Holland, and Gaulle tells us it has been bred from *Dilinia pusaria* in France. It appears very rare in Britain, whence it has not before been recorded; three specimens from Cornworthy and Slapton in



Devon are in Marshall's collection; I took a female on flowers of *Angelica* in Matley Bog on 24th August, 1901, and another carrying six live and active larvae on 12th August, 1906, in Tuddenham Fen.

7. *sphaerocephalus*, Grav.

Tryphon sphaerocephalus, Gr. I. E. ii. 247; Ste. Ill. M. vii. 251, ♀. *T. bisculptus*, Gr. I. E. ii. 251; Ste. Ill. M. vii. 252, ♂. *T. bifasciatus*, Zett. I. L. 389, ♂. *T. trisculptus*, Ste. Ill. M. vii. 252, ♂; Holmgr. Sv. Ak. Handl. 1854, p. 77, ♀. *Polyblastus sphaerocephalus*, Holmgr. *lib. cit.* 1855, p. 206; Brisch. Phys. Ges. König. 1871, p. 92; Schr. Nat. Ges. Danz. 1878, p. 97, ♂ ♀. *P. (Scoliorus) sphaerocephalus*, Thoms. O. E. ix. 903, ♂.

A shining, sparsely punctulate, black species with the mouth, cheeks, face, scape of ♀ beneath, tegulae and whole or part of anterior coxae, flavous; abdomen centrally and legs red. Clypeus subimpressed before its apex. Metathorax semiglobose, with five very distinct areae. Scutellum not pyramidal, laterally margined to its centre and apically sub-elevated. Basal segment somewhat broad, gradually dilated towards its laterally deplanate apex, with carinae short and distinct; second segment

centrally transversely impressed, twice broader than long and, like the third and base of fourth and apex of first, red; seventh of ♀ apically white; hypopygium large, vomeriform and broadly covering base of terebra. Legs not slender, red with apices of hind femora and usually whole or part of their coxae black; apical joint of hind tarsi hardly double length of penultimate; claws sparsely pectinate. Areolet entire; radial nervure subarcuate; nervellus intercepted below its centre. Length, 5 mm.

The ♂ has the face centrally black-lined and, Thomson says, the cheeks and coxae entirely black; Pfankuch found in 1906 that *T. biscalptus* differed in no way from the type form, and I find nothing by which to differentiate Stephens' three specimens of *T. triscalptus* in the British Museum.

At once known from the next species in its much squarer head and narrower petiole.

Silesia on umbells in September, and Italy (Grav.); Lapland (Zett.); Sweden early in August (Holmgr.); Prussia (Brisch.); France (Gaulle). "Scarce, found near London in June, and at Darenth Wood," etc. (Stephens); I possess a long series in Capron's collection from Surrey and have very occasionally taken it, always in June by sweeping herbage in the most boggy situations at Matley Bog in the New Forest, in Tuddenham Fen and thrice at Brandon in Suffolk.

8. *pastoralis*, Grav.

Tryphon pastoralis, Gr. I. E. ii. 248; i. 689; Ste. Ill. M. vii. 251, ♀. *Polyblastus mutabilis*, Holmgr. Sv. Ak. Handl. 1855, p. 206; Brisch. Phys. Ges. König. 1871, p. 92; Schr. Nat. Ges. Danz. 1878, p. 97, ♂ ♀.

A little shining, punctulate and black with the mouth, clypeus and tegulae flavidous; antennae ferrugineous beneath; legs and centre of abdomen red. Metathorax with three or five very distinct areae. Scutellum not pyramidal. Basal segment rugulose and somewhat shining, nearly as broad as metathorax, somewhat elevated basally and apically deplanate on either side, with stout and very distinct carinae; second segment transversely subimpressed centrally and, with the third and fourth, nearly entirely red. Legs red with the apices of hind femora and tibiae, and their tarsi, rarely nigrescent; all the coxae and trochanters red, rarely black or with the anterior apically flavidous; apical joint of hind tarsi hardly double length of penultimate. Areolet irregularly subpetiolate, often strongly incomplete or even wanting; radial nervure gradually curved apically; nervellus intercepted below its centre. Length, 4—5 mm.

This species is known from its immediate allies by the rugulose, broad, laterally rounded and basally elevated first segment, and its stout carinae; Pfankuch, who examined the types, says Gravenhorst was in error in describing the basal segment as smooth, and entirely synonymises Holmgren's species with it, since its author had brought it forward as distinct solely upon this structural basis.

A ♀ from Silesia (Grav.); Lapland and Sweden (Holmgr.); bred from larvae of *Nematus myosotidis* in Prussia (Brisch.); France (Gaulle). First taken by Hope at Netley, and said to be not common around London in June by Stephens; it is recorded from Nunton and Botusfleming by Marshall, Lands End by Marquand, St. Issey in Cornwall in Davies' coll.,

from Brundall by Bridgman; I have it from Surrey (Capron) and Tostock in Suffolk (Tuck). It is by no means common, though I took several at Peterborough by the Nene in June, 1908, and have swept it during the same month in Tuddenham Fen, at Claydon on 14th September, and taken it on carrot flowers at Eye and those of *Heracleum* at Rishangles in Suffolk, late in August. The four specimens named *Tryphon* (*Trematopygus*) *procurator* by Stephens in Mus. Brit., upon which that name has hitherto figured in our lists, are referable to the present species.

9. *pratensis*, Grav.

Tryphon pratensis, Gr. I. E. ii. 299; Ste. Ill. Man. vii. 260; Fonsc. Ann. Soc. Fr. 1849, p. 231, ♂. *Polyblastus pratensis*, Holmgr. Sv. Ak. Handl. 1855, p. 207; Thoms. O. E. ix. 903, ♂ ♀. Var. *Tryphon propinquus*, Gr. I. E. ii. 300; Ste. Ill. M. vii. 261, ♂. *T. obscurus*, Ste. Ill. M. vii. 253, ♂. *Polyblastus caudatus*, Holmgr. Sv. Ak. Handl. 1854, p. 74, ♀. *P. propinquus*, Holmgr. lib. cit. 1855, p. 206; cf. l. c. 1856, p. 387; Brisch. Schr. Nat. Ges. Danz. 1878, p. 98; Thoms. O. E. ix. 903, ♂ ♀.

Somewhat shining and black with the mouth, abdomen except basally, and most of the legs, red. Clypeus red, subconvex and apically rounded. Antennae somewhat shorter than the body, infuscate and at least in ♂ rufescent beneath. Metathorax with three distinct areae. Scutellum discally deplanate, laterally margined to its centre, and not pyramidal. Basal segment black, somewhat short, finely rugose and dilated towards its apex, with carinae extending to its centre; remainder of abdomen entirely red. Legs normal, red with (form typ.) coxae and trochanters except apices of latter, intermediate femora externally towards their base, and the hind ones broadly in the centre, black or (var. *propinquus*) the posterior coxae partly, hind trochanters dotted with, and their femora entirely, with hind tarsi and apices of their tibiae, black. Areolet irregularly petiolate or sessile; radial nervure slightly curved apically; nervellus intercepted below its centre. Length, 4—6 mm.

It appears of little use attempting to regard *Tryphon propinquus*, as distinct from *Tryphon pratensis*, Grav. Gravenhorst in erecting it thought them so similar that he queried both as varieties of *Neleges proditor*; and Pfankuch, examining the types in 1906, tells us that *T. propinquus* differs from *T. pratensis* only in having the antennae basally dull flavidous in place of entirely piceous, segments two to seven in place of two to four testaceous with the remainder pale-margined, the coxae testaceous, black-marked in place of entirely black, the femora slightly paler apically, and the hind tarsi with base and apex of their tibiae darker; he only instances one at all reliable point of distinction in the greater facial prominence of *P. pratensis*. Thomson differentiated *P. pratensis* by its basally black anterior femora, exactly as those of *P. propinquus* are described by Pfankuch; and *P. propinquus* by its "pleura concinne punctata," while Holmgren gives both as "pleuris nitidis, parse et remote punctatis." Specimens of the former from Scotland, named by Bridgman, agree *ad amussim* with specimens of the latter, named by Capron, in my collection, excepting in femoral colouration; the hind tibiae are often apically nigrescent with entirely pale tarsi. Thomson distinguished both under the subgeneric name *Trichocalymmus* on account solely of their densely tomentose clypeal foveae. I have seen Stephens' single ♂ *T. obscurus* in the National Collection.

Three males early in June on umbels in Hanover, and in Silesia (Grav.); Aix in April (Fonsc.); Sweden (Holmgr.). "Taken in the beginning of June near London" (Stephens); Nunton in Wilts. (Marshall coll.); it is apparently rare with us and I possess only three males and a female from Capron's Surrey collection. The var. *propinquus* has a similar distribution, extending to Vienna; Stephens records it from the London district; and Marshall has found it at Bishops Teignton and Barnstaple.

10. *rivalis*, Holmgr.

Polyblastus rivalis, Holmgr. Sv. Ak. Handl. 1855, p. 208, ♂ ♀. *P. hilaris*, Holmgr. lib. cit. p. 209, ♀; cf. Parf. Trans. Devon. Assoc. 1881, p. 276.

Somewhat shining, punctulate and black with the mouth, clypeus, tegulae and apical margins of the anal segments, stramineous; antennae more or less beneath, legs and centre of abdomen, red. Metathorax usually with three, very rarely five, areae. Scutellum not pyramidal, at most basally margined. Basal segment gradually dilated towards its apex, subscabriculous, with distinct carinae extending to a little beyond its centre; second segment subrugosely punctate, transversely impressed centrally, and red, usually entirely, though sometimes more or less nigrescent basally; third and fourth red with apex of latter black; following black, nitidulous and apically pale. Legs red with the coxae and trochanters either red or black; hind femora and tibiae apically, and their tarsi, more or less infusate; apical joint of hind tarsi hardly double length of penultimate. Areolet always wanting; radial nervure apically slightly reflexed; nervellus intercepted below its centre. Length, 5—6 mm.

I am persuaded that *P. hilaris* is no more than a colour variety of this species, differing solely in possessing an apical facial spot on either side, the flagellum black and scape flavidous beneath, and the legs red with only the coxae basally black; Holmgren himself was doubtful of its specific rank and described it from the female captured by Boheman in Lapland.

Holmgren says it is not uncommon in damp meadows in northern Sweden and Lapland, and Gaulle records it from France. It has been found by Bignell at Bickleigh in Devon on 6th September; but it is certainly rare, since I have taken but two males, on the banks of the Nene at Peterboro in the middle of June, 1908, and in a garden in Lyndhurst towards the middle of July, 1909.

11. *marginatus*, Holmgr.

Polyblastus marginatus, Holmgr. Sv. Ak. Handl. 1855, p. 210; Brisch. Phys. Ges. König. 1871, p. 93; Schr. Nat. Ges. Danz. 1878, p. 98, ♂ ♀. *P. (Scopiorus) marginatus*, Thoms. O. E. ix. 903. *P. arcuatus*, Holmgr. lib. cit. 209, ♀.

A shining and black species with the mouth, antennae beneath, and most of the legs red. Clypeus apically rounded; antennae somewhat shorter than body and red, infusate above. Metathorax with three, rarely five, somewhat distinct areae; petiolar area large and nearly perpendicular; epinemia entire. Scutellum subdeplanate, smooth and laterally margined to its apex; postscutellum distinctly bifoveolate. Basal

segment gradually dilated towards the depressed apex, with not very distinct carinae extending hardly beyond its centre; second segment centrally transversely impressed and, like the transverse third and fourth, red; hypopygium large, vomeriform and broadly covering base of terebra. Legs red with whole or apices of hind femora and apices of their flavidous tibiae alone infuscate; apical joint of hind tarsi hardly double length of penultimate; claws sparsely pectinate. Areolet wanting; radial nervure apically curved; nervellus intercepted below its centre. Length, 5—6 mm.

Known by its finely pectinate claws, centrally red abdomen, deplanate and entirely margined scutellum, and broadly red legs. The flagellum in both sexes is somewhat distinctly explanate in the centre.

It ranges from Lapland, through Sweden and Prussia, to France, and has not been bred. The only British record is by Bridgman, who says (Trans. Norf. Soc. v, p. 627) that he has captured an insect at Brundall near Norwich, which he considered a variety of this species. It is, however, by no means uncommon with us, occurring on hazel bushes in woods and the flowers of *Angelica sylvestris* from 16th June to 5th September; Dulwich (Marshall MS.); both sexes at Felden in Herts (Piffard); Delamere Forest in 1903 (Tomlin); Chatham in June, 1892 (de la Garde); Lands End (Marquand); Govilon in Wales (Marshall coll.); it has occurred to me about Ipswich at Foxhall and Bentley Woods.

12. *pinguis*, Grav.

Ichneumon pinguis, Gr. Mem. Ac. Sc. Torin. 1820, p. 373, ♂ ♀. *Tryphon pinguis*, Gr. I. E. ii. 150; Ste. Ill. M. vii. 235; Fonsc. Ann. Soc. Fr. 1849, p. 219, ♂ ♀. *Polyblastus pinguis*, Htg. Wieg. Arch. 1837, p. 155; Schiöd. Guér. Mag. 1839, p. 12, ♂; Nat. Tidskr. 1847, p. 98; Holmgr. Sv. Ak. Handl. 1855, p. 210; Brisch. Schr. Nat. Ges. Danz. 1878, p. 98, ♂ ♀.

Shining, pubescent, not finely punctate, black with the mouth, scape beneath and most of the legs flavous. Clypeus impressed before its apex; apices of cheeks reflexed and in ♂ produced. Antennae filiform and hardly shorter than body, usually ferrugineous beneath. Metathorax with the areae subobsolete, indeterminate and transverse; petiolar area subdiscreted. Scutellum convex, but not pyramidal. Basal segment broad, gradually dilated towards its apex, sparsely punctate, with obsolete and basal carinae; apical margin of all the segments red; terebra black and very shortly exserted. Legs not stout, flavous with coxae, most of hind femora and apices both of their tibiae and of their tarsal joints, black; intermediate femora often infuscate beneath. Areolet irregularly petiolate or subpetiolate; tegulae stramineous; nervellus intercepted a little below its centre. Length, 6—8 mm.

This is a very distinct insect and in its black abdomen, elongate pubescence, flavidous legs and obsolete metanotal areae only to be confused with *P. Westringi*, though much more convex with the incisures more distinctly impressed than that species.

Austria, Germany, Piedmont (Grav.), Aix in spring (Fonsc.), Denmark (Schiöd.), Sweden (Holmgr.), and Prussia (Brisch.). "Not common: taken at Darenth wood in May, and in other places within the metropolitan district" (Stephens); common in Norfolk (Bridgman); Shere in Surrey (Capron); Tuddenham Fen in Suffolk on 22nd June, 1906 (Nurse, E.M.M. 1907, p. 86). I consider it a rare species and have but once met with it, on 20th July, 1901, when two females occurred on flowers of *Heracleum sphondylium* on the Southwold cliffs of the Suffolk coast.

13. *Westringi*, *Holmgr.*

Polyblastus Westringi, Holmgr. Sv. Ak. Handl. 1855, p. 210, ♀.

A strongly nitidulous, black species with the mouth, clypeus, broad lateral ♀ facial marks, tegulae, segmental apices and part of legs, flavidous. Clypeus convex and slightly impressed before its subtruncate apex. Antennae a little shorter than body and infusate, becoming rufescent basally beneath. Metathorax semiglobose, with the areae obsolete and incomplete. Scutellum not pyramidal. First segment narrowed towards its base, somewhat smooth, margined, and subsulcate beyond the centre, with its carinae indeterminate; following segments transverse, shining and pale-margined; terebra exerted, black and pilose. Legs normal and pale red with apices of hind femora, tarsi and tibiae black, the last concolorous before their base and centrally, like the anterior trochanters, flavous; hind coxae of ♀ sometimes partly infusate. Areolet usually wanting; stigma black; radial nervure apically subreflexed; nervellus intercepted below its centre. Length, 5 mm. ♂ ♀.

All the examples I have seen lack areolet, which is not indicated by its author and will at once distinguish this species from *P. pinguis*, than which it is more slender. The undescribed ♂ is commoner than the ♀ with us; it differs in nothing but the paler hind coxae, antennal base and immaculate flavous face.

Boheman and Holmgren found this species in pine woods in Sweden during the middle of July, and Gaulle says it extends to France. Though not hitherto recorded from Britain, it is one of our commonest species, ranging at least from the Isle of Wight to Yorkshire; Bishops Teignton (Marshall coll.), Plym Bridge in Devon, 14th July (Bignell), South Cove near Hull in June, 1907 (Roebuck); Guestling near Hastings (Bloomfield), Box Hill, Surrey, in 1874 (Champion), a full series from Shere (Capron coll.); I have captured it in Marvell Copse, near Newport in Isle of Wight, in June, swept it in Tuddenham Fen in Suffolk early in July, and beaten it from hazel bushes at Ringstead in Norfolk in August; Grimshaw took it at Westport, Co. Mayo, in August, 1911.

14. *sanguinatorius*, *Ratz.*

Tryphon sanguinatorius, Ratz. Ichn. d. Forst. iii. 129, ♂. *Polyblastus sanguinatorius*, Holmgr. Sv. Ak. Handl. 1855, p. 213, ♀; Brisch. Phys. Ges. König. 1871, p. 93; Schr. Nat. Ges. Danz. 1878, p. 99, ♂ ♀.

Shining and black with the thorax broadly red and the mouth, clypeus, lateral facial marks, tegulae, segmental apices and venter pale stramineous. Clypeus convex and subimpressed before its rounded apex. Antennae a little shorter than body, pale ferrugineous with the scape black, stramineous beneath. Mesothorax entirely bright red; metathorax short and black, with the areola very distinct and costulae obsolete; petiolar area subperpendicular. Scutellum black and convex, but not pyramidal. Basal segment subconvex, rugose, with the carinae stout and extending nearly to apex; second and base of third also rugose, with the remainder nitidulous; terebra exerted, black and pilose. Legs somewhat slender and red with anterior trochanters stramineous, hind tarsi and apices of their white-pilose tibiae infusate; apical joint of front tarsi somewhat dilated;

all claws very distinctly pectinate. Areolet narrow, strongly oblique and apically incomplete; radial nervure apically nearly straight; nervellus intercepted below its centre. Length, 6—7 mm.

The unique colouration is remarkable.

Ratzburg records a single ♂ bred from a pupa of *Cladius eucera* in Germany in 1852; Holmgren knew two Swedish ♀♀ taken by Boheman and himself in grassy places on 5th September; Gaulle records it from France; and Brischke bred both sexes in Prussia from larvae of *Cladius viminalis* and unknown species of *Nematus*. It was introduced as British by Bridgman (Trans. Ent. Soc. 1887, p. 374) on the strength of a single example bred from an unknown host, probably at Worthing, by Mr. W. H. B. Fletcher. A beautiful ♀ emerged in my breeding cage on 26th May, 1903, from the cocoon of *Cladius viminalis*, taken at Holbrook in Suffolk on 11th of the preceding February.

15. *Wahlbergi*, Holmgr.

Polyblastus Wahlbergi, Holmgr. Sv. Ak. Handl. 1855, p. 213; Brisch. Schr. Nat. Ges. Danz. 1878, p. 99, ♂ ♀.

Shining and black with the mouth, apex of clypeus, scape beneath, tegulae, discal abdominal vitta, venter and nearly whole of legs, pale testaceous. Clypeus somewhat convex and slightly impressed before its subrotund apex. Antennae somewhat shorter than the body, filiform and infusate, paler beneath with the scape testaceous. Metathorax punctate and somewhat dull, with three distinct areae. Scutellum not pyramidal. Basal segment gradually dilated towards its apex, impressed on either side and distinctly sulcate centrally; remaining segments deplanate and nearly smooth; the second and third with their apices and a common, more or less broad discal vitta testaceous; terebra slender and exserted. Legs normal and pale testaceous with the hind femora, tarsi and in ♀ apical half of their tibiae, piceous. Areolet subsessile; radial nervure apically nearly straight; nervellus oblique and intercepted below its centre. Length, 5—6 mm.

The peculiar and constant plaga on the abdominal disc renders this species unmistakable.

The first indication we have of this species as British is a male, exhibited at a meeting of the Ent. Soc. (Proc. 1880, p. xxviii), captured at Ashstead, in Surrey. It is not uncommon with us, however, and has a distribution from Sweden, through Prussia where Brischke bred it from larvae of *Fenusa betulae*, to France, whence Gaulle gives *Kaliosysphinga pumila* as host. Several from Cornworthy and Botusfleming (Marshall coll.), several from Shere in Surrey (Capron coll.), Kings Lynn, several in July, 1909 (Atmore), a large male on 24th July, 1904, at Braemar (Elliott).

16. *subalpinus*, Holmgr.

Polyblastus subalpinus, Holmgr. Sv. Ak. Handl. 1855, p. 211, ♂ ♀.

A somewhat shining, pubescent and black species with only the anterior legs red and hind tibiae white-banded. Clypeus red and sub-impressed before its rounded apex. Antennae somewhat shorter than the body, apically rufescent beneath. Metathorax short, with distinct and

transverse areae; petiolar area subperpendicular. Abdomen discally black, with only the ventral plica pale; basal segment margined, finely rugose-punctate, discally subdeplanate and gradually dilated towards its apex, with weak carinae; second and base of third segment subrugulose punctate, and the following shining. Legs somewhat slender, black with the anterior, except basally, red; hind tibiae distinctly white-banded centrally. Areolet entire; radial nervure slightly curved apically; nervellus intercepted in or hardly below its centre. Length, 5—6 mm.

At once known by its black, centrally white-banded, hind tibiae; both the British females differ from the above description in having the hind femora red.

It is recorded by its author from Sweden and southern Lapland in 1855, and I am not aware that it has been since mentioned in literature. I swept a single ♀, carrying larvae, from low herbage in a very marshy spot at Brandon in Suffolk on 23rd June, 1909, and find there is a similar unnamed specimen, also with larvae, in Dr. Capron's Surrey collection.

17. *melanostigmus*, Holmgr.

Polyblastus melanostigmus, Holmgr. Sv. Ak. Handl. 1855, p. 214; Brisch. Schr. Nat. Ges. Danz. 1878, p. 100, ♂. *P. (Nemioblastus) melanostigma*, Thoms. O. E. ix. 901, ♂ ♀.

Shining and black with the mouth, clypeus and tegulae flavous, and the legs nearly entirely red. Clypeus convex and transversely impressed before its subrotund apex; oral costa not dentately elevated; cheeks short. Antennae somewhat shorter than body, filiform and infusate with scape obsoletely rufescent beneath. Metathorax with five distinct areae, of which the areola is a little longer than broad. Scutellum not pyramidal. Basal segment very distinctly constricted basally, margined, impressed on either side beyond the centre, with somewhat determinate carinae; second segment transverse and not at all impressed centrally, with distinct thyridii; terebra distinctly exerted, apically dilated and setose, with the hypopygium retracted and oviferous. Legs slender and red, with only the hind tarsi and apices of their tibiae nigrescent. Areolet wanting; stigma black with its base pale; radial nervure externally straight; nervellus oblique and intercepted below its centre. Length, 7 mm.

One of our largest species, distinguished by the black abdomen and entirely unimpressed second segment. I know not why Dalla Torre relegates the three species of *Polyblastus*, treated of by Thomson under a slight subgenus, *Nemioblastus* (not placed by Ashmead), to a position alongside *Plectiscus* in the Ophioninae; they are true Tryphonids, differing from normal *Polyblastus* only in such minor points as the structure of the genal costa, and the areolet, as in other cases, wanting.

I do not find this species recorded from Britain; it is said to be rare in Sweden, to occur in July, and to have been bred by Brischke in Prussia from an undetermined host. I possess two females from Piffard's collection, captured at Felden in Herts on 3rd June, 1900, and from Dr. Capron's from Surrey. There is an oviferous ♀, misnamed *P. grammicus*, Holmgr., in Marshall's collection, in the British Museum, which was captured at Dulwich in August, 1890.

18. pyramidatus, Holmgr.

Polyblastus pyramidatus, Holmgr. Sv. Ak. Handl. 1855, p. 219, ♀.

Somewhat shining and black with the mouth, clypeus, scape beneath, tegulae and venter pale stramineous. Clypeus somewhat impressed before its rounded apex; flagellum apically rufescent beneath. Metathorax with five distinct areae. Scutellum very strongly elevated, subpyramidal. Basal segment somewhat short, very finely rugose-punctate, with distinct carinae extending a little beyond its centre; incisures of the second and third segments pale. Legs red with the hind tarsi and tibiae alone black, and the latter centrally white-banded. Areolet triangular; radial nervure apically a little curved; nervellus intercepted below its centre. Length, 4 mm. ♂ unknown.

The subpyramidal scutellum and white-banded hind tibiae render this species quite distinct from the remainder of its genus.

Boheman captured the type in Lapland. Our only record is by Bignell, doubtless upon Bridgman's authority, "Captured at Longbridge, 27th June," in Devonshire; the specimen is in the Plymouth Municipal Museum, to which Bignell presented his collection in 1909.

19. bidentatus, Steph.

Tryphon bidentatus, Ste. Ill. M. vii. 253, ♀.

A black species with the abdomen centrally, and the legs mainly, red. Head transverse, not constricted posteriorly with the mandibles and apex of the discreted clypeus dull red; frons closely and evenly punctate. Antennae rufescent beneath. Thorax immaculate black, with the metanotal carinae obsolete and costulae wanting. Scutellum pyramidal and discally concave, black. Abdomen black and fusiform, with the second and third segments entirely, with apex of the first and margins of the fourth, bright red; basal segment very stout and broad, but little constricted basally, with the spiracular tubercles enormously developed and the discal carinae extending beyond them. Legs red with the coxae, trochanters, hind femora and apices of their tibiae black. Wings with areolet triangular and sessile; stigma piceous and basally whitish; nervellus intercepted a little below its centre. Length, 8 mm. ♀ only.

This description is drawn from the single female from Stephens' collection, now in Mus. Brit., which has not been noticed since first described in 1835 and was said by its author (*loc. cit.*) to have been "found in July near London."

ERROMENUS, Holmgren.

Holmgr. Sv. Ak. Handl. 1855, p. 221.

Head transverse; vertex somewhat deplanate and frons compressed above the scrobes; face centrally subelevated; clypeus deeply discreted; mandibles broad with subequal teeth. Antennae simple, somewhat stout and shorter than body, with about twenty-seven flagellar joints. Thorax stout, gibbulous and a little longer than high; sternum very short and

deeply sulcate. Scutellum a little convex and apically broadly rounded. Abdomen sessile and convex, with the anus obtuse; terebra short, stout, curved and apically acuminate. Legs somewhat short and distinctly stout, with the femora and calcaria incrassate; hind tarsi not incrassate, their claws somewhat obsoletely pectinate. Wings with areolet nearly always present, oblique and irregular; basal nervure subvertical and slightly arcuate.

This genus may be known by the short legs with stout femora and calcaria, sublunate terebra, elongate costella and subvertical basal nervure. Its species, which occur in woods and fields, oviposit in Hymenopterous larvae. In their stout legs, basally pale tibiae and more or less protuberant face they approach the *Exochides*, though the structure of the head above the scrobes is quite distinct. The genus *Trichocalymma*, Först., has been used by Woldstedt for such species of the present genus as possess no areolet; but it is impossible to erect such a division, since some vary from the possession of well developed areolet to its utter lack; Thomson, on the other hand, has used Förster's name for a division of *Polyblastus*. The species, with the exception of the first, are so similar in structure that they are difficult to tabulate, except upon the unsatisfactory basis of colour, and I anticipate further synonymy; thus both *E. plebejus* and *E. analis* may be no more than colour varieties of *E. brunnicans*, as possibly may also be *E. zonarius*, since the puncturation of the basal segment is hardly more than fuller development. Thomson founds his division on the tomentose or nude clypeal foveae, an obscure and somewhat fugitive point.

Table of Species.

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|-------|---|-------------------------|
| (2). | 1. Legs entirely red; scutellum very strongly convex | 1. CALCATOR, Müll. |
| (1). | 2. Legs not entirely red; scutellum not very strongly convex. | |
| (4). | 3. Areolet wanting; carinae of basal segment extending nearly to apex | 2. PLEBEJUS, Wold. |
| (3). | 4. Areolet subentire; carinae of basal segment shorter. | |
| (12). | 5. Hind femora entirely rufescent. | |
| (9). | 6. Abdomen broadly red. | |
| (8). | 7. Basal segment sparsely punctate and alone black | 3. BRUNNICANS, Grav. |
| (7). | 8. Basal segments strongly punctate, the central alone red | 4. ZONARIUS, Grav. |
| (6). | 9. Abdomen black, with at most incisures pale. | |
| (11). | 10. Basal segment rugulose, with carinae nearly reaching apex | 5. PUNCTULATUS, Holmgr. |
| (10). | 11. Basal segment subglabrous, with carinae only to centre | 6. FRENATOR, Grav. |
| (5). | 12. Hind femora partly black. | |
| (14). | 13. Hind femora centrally black; anus rufescent | 7. ANALIS, Brisch. |
| (13). | 14. Hind femora apically black; central segments rufescent | 8. FASCIATUS, Grav. |

1. *calcator*, Müll.

Ichneumon calcator, Müll. Prodr. 158. *I. erythropus*, Gmel. S. N. i. 2705. *Tryphon calcator*, Gr. I. E. ii. 138; Ste. Illus. M. vii. 235; Ratz. Ichn. d. Forst. i. 129; iii. 125. *Polyblastus calcator*, Brisch. Schr. Phys. Ges. König. 1871, p. 94, ♂; cf. Marsh. Ent. Ann. 1874, p. 143. *P. carinatus*, Holmgr. Sv. Ak. Handl. 1855, p. 220; Brisch. Schr. Phys. Ges. König. 1871, p. 94; Schr. Nat. Ges. Danz. 1878, p. 100, ♂. *P. oelandicus*, Holmgr. Sv. Ak. 1855, p. 220, ♂. *Erromenus Oelandicus*, Thoms. O. E. ix. 904, ♀. *E. calcator*, Pfank. Zeits. Hym.-Dip. 1906, p. 87.

A nitidulous, black species, with only the legs entirely red and areolet wanting. Head not constricted posteriorly, black with mandibles, palpi and the apically rounded, distinctly discreted and somewhat impressed clypeus, red; face centrally prominent; frons apically subimpressed. Antennae a little longer than head and thorax; black, broadly rufescent below. Thorax stout, convex, punctate; mesonotal notauli distinct in front; pleurae aciculate-punctate; metathorax strongly rugose with five (form typ.) or three (var. *Oelandicus*) distinct discal areae. Scutellum rugulose or scabriculous, very strongly convex and apically eroded. Abdomen deplanate, black with central incisions usually rufescent; three basal segments finely scabriculous, the following shining and smoother; basal segment rugose, hardly convex, apically deplanate, margined, with carinae extending a little beyond its centre or nearly to its apex; second transverse and obliquely subimpressed basally on either side. Legs fulvous with the tibiae externally pale-pubescent, and both pulvilli and unguiculi often infusate. Wings slightly clouded, stigma and nervures infusate; areolet wanting; radial nervure apically nearly straight; nervellus intercepted a little below its centre. Length, 6—8 mm.

This species is not unlike *E. punctulatus* superficially, but with the structure of the head and thorax very different; and the scutellum renders it unmistakable.

It occurs in Germany, uncommonly in Sweden, Denmark, Lapland; Pfankuch says he has often found it in Switzerland, and Dours records it from France. Ratzeburg's mention of its parasitism upon *Lophyrus pini* may be correct, but its emergence from *Tortrix (Coccyx) resinana* is doubtless an error. With us it was brought forward as scarce in July near London by Stephens in 1835; and Bridgman found *P. carinatus* at Earlham in Norfolk. It is doubtless uncommon, since I have never taken it; Dr. Capron found several about Shere in Surrey, and Miss Chawner has given me three from the New Forest, probably bred by her from some sawfly, since a specimen in Marshall's collection is labelled "From *Nematus ribesii*, Scotland, Cameron"; and shows wide distribution. Bairstow records (Trans. Yorks. Nat. 1878, p. 69) a ♂ from Bishop Wood, York; and Thornley has given me one he took at South Leverton in Notts during June.

2. *plebejus*, Wold.

Trichocalymma plebejum, Wold. Bull. Ac. Petersb. 1877, p. 456, ♂.

A shining black species, with apex of abdomen broadly red. Head a little constricted posteriorly; frons apically impressed; face centrally tuberculate; mouth and clypeus rufescent. Antennae somewhat stout, shorter than body, with flagellum infusate ferrugineous. Thorax stout; metathorax short with five distinct discal areae, of which the areola is

hexagonal and hardly broader than long. Abdomen not shorter than thorax and red with the first segment entirely, second basally and a central fascia, nigrescent; basal segment somewhat convex, with carinae extending nearly to its apex. Legs stout and black with only the tibiae, which are not paler basally, tarsi and apices of femora rufescent. Wings somewhat broad and a little clouded; stigma and tegulae ferrugineous, radix pale; areolet wanting; nervellus intercepted below its centre. Length, 4—5 mm. ♂ only.

The ♀ differs solely in having the third and fourth segments infusate basally, with the terebra black and not exserted.

This species was placed by Bridgman in the present genus and recorded by him (Trans. Ent. Soc. 1886, p. 364) as taken on 11th June, 1885, at Dulwich in south London; elsewhere it is only known from Russia. I have a single pair; the male was captured by Albert Piffard at Felden near Boxmoor in Hertfordshire, and I swept the female from rank herbage on 27th August, 1905, in Tuddenham Fen, Suffolk. Stenton took one at Wimbledon, early in August, 1910.

3. *brunnicans*, Grav.

Tryphon brunnicans, Gr. I. E. ii. 270; Ste. Ill. M. vii. 257, ♂ ♀. *Polyblastus brunnicans*, Holmgr. Sv. Ak. Handl. 1854, p. 75, ♂ ♀. *Erromenus brunnicans*, Holmgr. *lib. cit.* 1855, p. 221; Brisch. Schr. Phys. König. 1871, p. 95; Schr. Nat. Ges. Danz. 1878, p. 101; Thoms. O. E. ix. 904, ♂ ♀.

Shining and black. Head hardly constricted posteriorly, with mouth red; face laterally white-pilose to clypeus. Antennae subfiliform and



longer than half body, sometimes ferrugineous apically. Thorax gibbulous with nitidulous pleurae; metathorax short, with five distinct transverse discal areas, the areola glabrous and subcircular. Scutellum black. Abdomen red and convex, with only the first segment black; basal segment sparsely punctate, gradually explanate apically, a little convex with

discal carinae extending beyond its centre; terebra black and very shortly exerted. All the legs red with coxae and trochanters alone black or rarely badius; tibiae always basally flavescent. Wings with stigma black, radix and tegulae stramineous; radial nervure a little reflexed at base and apex; areolet irregularly transverse-triangular and petiolate; nervellus intercepted below its centre. Length, 5—6 mm.

The areolet is very rarely obsolete or wanting, and the anus (Grav.) or most of the abdomen (Brisch.) occasionally black.

A common species from May to July in Germany, sometimes on umbeliferous flowers; Austria (Gravenhorst); not very common in central and southern Sweden (Holmgren); Belgium (Tosquinet); and France (Gaulle). It has not yet been bred, which is strange considering its frequency. In Britain, Stephens says it was found uncommonly near London in June; Marshall took it at Bugbrooke in Northants, and Bridgman at Earlham in Norfolk. There are several in Capron's collection from Shere in Surrey; Stenton took it at Herne Hill in June, 1909; it has often occurred to me by sweeping and on the flowers of *Heracleum sphondylium* in Suffolk at Tostock, Tuddenham Fen, Westleton pits, etc., from 10th July to 19th August; and on 7th September, 1908, I took a specimen investigating a colony of *Aphis crataegi*, Kalt., on a whitethorn bush and sucking their honey-dew in my garden at Monks' Soham.

4. *zonarius*, Grav.

Ichneumon zonarius, Gr. Mem. Ac. Sc. Torin. 1820, p. 380, ♀. *Tryphon zonarius*, Gr. I. E. ii. 268, ♂ ♀. *Erromenus zonarius*, Holmgr. Sv. Ak. Handl. 1855, p. 221; Brisch. Schr. Nat. Ges. Danz. 1878, p. 101; 1892, p. 41; Thoms. O. E. ix. 904; Pfank. Zeits. Hym. Dip. 1907, p. 21, ♂ ♀.

Shining, punctulate and black, with the second or second and third segments entirely red. Head a little constricted posteriorly; frons sparsely punctate; face closely punctate centrally; mouth red. Antennae filiform and shorter than body. Thorax stout, pubescent, black and punctulate; metathorax with five distinct discal areas, of which the areola is subquadrate and the lateral areas transverse. Scutellum discally subdeplanate and laterally margined to its centre. Abdomen subcylindrical, centrally fulvous with the apical margins of all the segments discally pale; three basal segments punctate, remainder smoother; basal segment a little convex, margined, strongly punctate, with carinae extending beyond its centre; terebra very shortly exerted. Legs stout and red with coxae, trochanters and at least the basal half of anterior femora black; tibiae basally whitish; hind femora black-marked basally only beneath. Wings with stigma and tegulae black, radix stramineous; areolet irregular and subpetiolate; radial nervure nearly straight apically; nervellus antefurcal and intercepted far below its centre. Length, 5—7 mm.

I know nothing of this species. Gravenhorst possessed five examples from Piedmont, Austria, and umbeliferous flowers in August in Germany; it appears to be rare in Sweden and is recorded from France by Gaulle. It was brought forward as British by Rev. T. A. Marshall in his 1870 *Catalogus* but no one has referred to it since then, and it is not represented in his collection.

5. *punctulatus*, Holmgr.

Erromenus punctulatus, Holmgr. Sv. Ak. Handl. 1855, p. 222, ♂; Brisch. Schr. Nat. Ges. Danz. 1878, p. 101; Wold. Hor. Soc. Ross. 1881, p. 64; Thoms. O. E. ix. 904, ♀.

A punctate species, a little shining and black, with the legs alone red. Head not constricted posteriorly and somewhat nitidulous; clypeus distinctly discreted, apically rounded and red; frons strongly and not closely punctate; face punctate and prominent below the scrobes. Antennae often apically rufescent beneath. Thorax as broad as the head, stout, punctate and somewhat shining; pleurae not dull and apically sub-punctate; metathorax short, rugulosely punctate with five very distinct discal areae. Abdomen a little longer than head and thorax, entirely black, with the three basal segments dull, finely rugose and subparallel-sided; basal segment convex, margined, finely and rugulosely punctate, with carinae extending nearly to its apex; second obliquely impressed basally on either side. Legs stout and red with coxae and trochanters, except extreme apices of latter, black. Wings with radial nervure a little reflexed apically; nervellus intercepted below its centre. Length, 5—6 mm.

At once known from the remainder of the genus by its dull abdomen, with the three basal segments finely and rugulosely punctate.

This distinct species has been found in Sweden, Lapland, Prussia and France. It has not before been noticed as British, but I possess a single male, which I took by sweeping herbage at Eaton near Norwich on 9th June, 1901; and there is, I believe, another in the Edinburgh Museum.

6. *frenator*, Grav.

Exochus frenator, Gr. I. E. ii. 332; Ste. Illus. M. vii. 264; Fonsc. Ann. Soc. Fr. 1849, p. 233, ♂ ♀. *Erromenus frenator*, Holmgr. Sv. Ak. Handl. 1855, p. 222, excl. ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 101; 1887, p. 87; 1892, p. 41; Thoms. O. E. ix. 905, ♂ ♀.

Punctulate, sericeous and somewhat shining, black with the clypeus apically red. Antennae a little longer than half body, black and rarely ferrugineous basally. Thorax gibbulous; metanotum with five very distinct discal areae. Abdomen black with only the apical margins of segments discally red; basal segment margined, not convex, nearly smooth, with carinae extending to its centre; second segment obliquely impressed on either side at its base. Legs stout and red with the coxae and trochanters, except extreme apices of latter, black; tibiae often basally flavidous. Wings with stigma infusate and tegulae testaceous; areolet small, irregular, obliquely transverse and petiolate or subpetiolate or sub-sessile; nervellus intercepted below its centre. Length, 5—6 mm.

This species is very like *E. punctulatus*, but much more finely punctate with the abdomen discally smoother. Woldstedt in 1877 synonymises with it *Tryphon haemorrhoidis*, Htg. (Jahresb. 1838, p. 27; Ratz. Ichn. d. Forst. i. 129, ♀), but both were known to Brischke, who considers them distinct under the present genus in 1878; the latter has been bred from

the cocoons of *Lophyrus pini* in Germany. Gravenhorst mentions a variety with the hind legs mainly black.

It is by far the commonest of its genus both here and abroad; de Fonscolombe says it occurs about Aix in the spring, that it is frequent in September and beginning of October on umbelliferous flowers, especially *Pucedanum silaüs*; it occurs in Germany in flowers and grassy places in July and August, though apparently rare in Sweden and but once bred, from *Psecadia pusiella*. "Not very abundant: taken at Darenth wood in June, and other places within the metropolitan district" (Stephens); Brundall, Eaton and Poringland, in Norfolk (Bridgman); fifteen from Bugbrooke in Northants, Nunton in Wilts, Cornworthy in Devon and Botusfleming in Cornwall (in coll. Marshall); a full series from Shere in Surrey (Capron coll.); on *Angelica* flowers at Tostock and Finborough Park, Suffolk, in September and two at Bungay on 3rd October, 1900 (Tuck). It has occurred to me in the same county, always on the flowers of *Foeniculum vulgare*, *Angelica sylvestris* and *Heracleum sphondylium* during the last eleven years at Alderton, Kenton, Fordley, and in my Monks' Soham garden, from 26th August to 29th September only. It is not known to hibernate.

7. *analıs*, *Brisch*.

Erromenus analıs, Brisch. Schr. Nat. Ges. Danz. 1878, p. 101, ♂ ♀; cf. Phys. Ges. König. 1871, p. 95; Thoms. O. E. xii. 1258, ♀.

A black species, with the hind femora concolorous and anus red. Head narrower than thorax and not constricted posteriorly; face strongly protuberant and centrally closely punctate; mouth and clypeus red, with the latter deeply discreted and its lateral foveae not tomentose. Antennae short with the flagellum piceous, its second joint almost transverse. Thorax somewhat shining, with distinct notauli; metathorax punctate with five discal areae, of which the areola is longer than broad and parallel-sided. Abdomen black with the anus more or less broadly and terebra red or castaneous; basal segment dull; second to fifth narrowly fulvous apically; middle of fifth to apex usually red; venter pale. Legs red, with the hind femora and trochanters more or less black; tibiae basally pale; front femora basally black-marked. Wings with tegulae and radix flavous, stigma piceous; areolet triangular, oblique and petiolate; nervellus intercepted below its centre. Length, $3\frac{1}{2}$ —7 mm.

This species is narrower, but hardly smaller than *E. frenator*. It is said by its author and Bridgman to resemble the genus *Exochus* in the conformation of thorax and abdomen; the latter adds (Trans. Ent. Soc. 1883, p. 169) that the central incisures are not always pale, the hind tibiae sometimes have a prebasal dark mark and the posterior tarsi are apically piceous.

Brischke bred it in Prussia from *Nematus* larvae feeding on *Salix viminalis* and from a gall of *Nematus Valisnieri*; and Thomson has found it in Sweden. Bridgman introduced it as British (*loc. cit.*) on the strength of a single male bred by J. E. Fletcher of Worcester from *Nematus crassulus*. There are two examples in Marshall's collection from Botusfleming in Cornwall and another, of the minimum size, from Lastingham in Yorks. Stenton has met with it in June and July at Herne Hill and Wimbledon.

8. *fasciatus*, Grav.

Tryphon fasciatus, Gr. I. E. ii. 139, ♂; cf. Pfan. Zeits. Hym. Dip. 1906, p. 87; Ste. Illus. M. vii. 236. *Erromenus fasciatus*, Gir. Ann. Soc. Fr. 1871, pp. 387, 404, ♂ ♀.

Head not constricted posteriorly; clypeal foveae not setiferous; face centrally elevated and strongly punctate; palpi white, mandibles centrally fulvidous, face and clypeus black. Antennae a little longer than half body, subsetaceous; scape black. Thorax with meso-notum and -pleurae punctate and nitidulous; metanotum completely areated, with strong costulae. Abdomen with two basal segments rugose and shining, the former's carinae extending to centre; second and third segments with red fascia, remainder black, shining and narrowly flavous-margined. Legs with coxae and trochanters black, latter apically paler; anterior tibiae and tarsi fulvous; hind femora stout, fulvous and apically black, their tibiae basally fulvous with remainder, like their tarsi, black. Areolet large, oblique, irregular, subpetiolate and hardly complete; stigma piceous; nervellus intercepted far below its centre. Length, 6 mm.

This species stood under *Tryphon* in our last (1872) catalogue, but Giraud transposed it to the present genus (cf. Bridgman, Trans. Ent. Soc. 1882, p. 158) and its position is confirmed by Pfankuch, from whose description of the type the above is mainly drawn.

The original male was captured in Hercynia in June; and elsewhere it is only recorded from France, where it has been bred from *Mesoneura opaca* (*Dineura verna*) by Giraud. Our sole claim to this species as indigenous rests upon Stephens' record "Scarce; found in June near London," published in 1835; no one has mentioned it here since that time and it must be regarded as very doubtfully British. I possess a single ♂, which I here place with grave misgiving, since the antennae are much longer than in any other of the species; I swept it from hazel bushes on 16th June, 1902, in the Bentley Woods near Ipswich.

GRYPOCENTRUS, Ruthe.

Ruthe, Stett. Ent. Zeit. 1855, p. 51.

Head subbuccate, generally somewhat dilated behind the eyes; face a little prominent; clypeus deeply discreted, strongly elevated and apically ciliate; mouth not entirely closed, labrum not exerted; mandibular teeth nearly always of unequal length, the lower the shorter. Antennae shorter than body, of nineteen to twenty-one joints with the pedicellus large and basal flagellar joint hardly double its length. Metathorax short with the discal areae subdistinct though incomplete. Abdomen subsessile with the basal segment gradually dilated apically, not discally carinate, very rarely subpetiolate and slightly curved; terebra distinctly reflexed and not exerted. Legs normal with hind tibiae stout and basally constricted, calcaria short, tarsi pectinate. Wings somewhat ample; areolet pentagonal, subtriangular or wanting; stigma large; radial cell short and subtrapeziform.

A genus of very small species (almost—with those of the following—the only very small species in the Tryphonides), with large head, short

and stout thorax, and oval abdomen. It was divided into three by Thomson on account of the petiolate abdomen of some of the species placed here by Holmgren and now relegated to *Lathrolestus*, while *Rhaestus* has entirely distinct facies. A great deal yet remains to be done in the elucidation of the small insects constituting the present genus; the specific characters now in use are not good; and I possess three or four other British species, which it appears inadvisable to at present synonymise with Continental names. The untenable position of this genus in Dalla Torre's catalogue appears referable to Ashmead, who in 1900 also placed it in the *Plectiscidae*, with which it has nothing in common, as is abundantly proved both by its structure and Tenthredinid hosts, which also include *Blennocampa apicalis* whence his new *G. lucidus* (Schr. Nat. Ges. Danz. 1888, p. 11) was bred by Brischke.

Table of Species.

- | | | |
|------|---|------------------------------|
| (6). | 1. Metanotal areae strong; abdomen with at most incisures pale. | |
| (5). | 2. Abdomen with segments apically pale and the anterior transimpressed. | |
| (4). | 3. Mesopleurae punctate; areolet entirely wanting | 1. CINCTELLUS, <i>Ruthe.</i> |
| (3). | 4. Mesopleurae glabrous; areolet nearly always entire | 2. INCISULUS, <i>Ruthe.</i> |
| (2). | 5. Abdomen entirely black with no segment transimpressed | 3. ALBIPES, <i>Ruthe.</i> |
| (1). | 6. Metanotal areae obsolete; abdomen centrally broadly red | 4. ANOMALUS, <i>Brisch.</i> |

1. *cinctellus*, *Ruthe.*

Grypocentrus cinctellus, Ruthe, Stett. Ent. Zeit. 1855, p. 54; Holmgr. Sv. Ak. Handl. 1855, p. 193, ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 94, ♂ ♀.

Pubescent and somewhat shining, with abdominal incisures red and areolet wanting. Head tumidulous and not posteriorly constricted, shining and punctulate; ♂ with palpi and mandibles flavous; face somewhat prominent centrally; clypeus strongly elevated, deeply discreted and apically subrounded, smaller in ♂; mandibles red with the unequal teeth infuscate. Antennae a little shorter than body, infuscate and paler below, scape elongate and not excised, pedicellus as long as basal flagellar joint; scape of ♂ flavous below. Thorax shining and black, almost narrower than head and sparsely punctulate; notauli obsolete, mesopleurae apically punctulate; metathorax short with discal areae and costulae entire, petiolar area rounded, spiracles circular. Scutellum convex and punctulate. Abdomen subovate, as long as head and thorax; basal segment punctulate, margined, with subdeterminate discal carinae, basally constricted and subcircularly foveate; second and third segments transverse, punctulate, transversely subimpressed before their apices and nigrescent with the apical margin broadly rufescent; fourth rufescent with a basal fascia or lateral marks infuscate, remainder rufescent. Legs normal and testaceous with the coxae basally, and hind femora more or less, infuscate; hind tibiae stout and in ♂ infuscate. Wings slightly clouded, broad;

radix and tegulae of ♂ flavous; stigma large and triangular, areolet wanting; radial cell short, subtrapeziform and apically reflexed; nervellus intercepted below its centre. Length, 4—5 mm.

At once known from the following species by its larger size, total lack of alar areolet and the entirely red anus.

It was described from Germany and Boheman took the ♀ in Sweden; subsequently Brischke bred both sexes from *Fenusa* larvae feeding on *Geum*, the Avens, in Prussia and Gaulle records it from France. With us it was introduced by Bridgman (Trans. Ent. Soc. 1887, p. 373) on the strength of specimens recently taken by Dr. Capron about Shere in Surrey. These seven examples are now in my collection, together with females I captured in the middle of August, 1902, in a greenhouse at Ryde, Isle of Wight, and among osiers at Barton Mills in June; W. Ollis has taken it at Hastings in July.

2. *incisulus*, Ruthe.

Grypocentrus incisulus, Ruthe, Stett. Ent. Zeit. 1855, p. 55; Holmgr. Sv. Ak. Handl. 1855, p. 194; Brisch. Schr. Nat. Ges. Danz. 1878, p. 94, ♂ ♀.

Shining, pubescent and black with abdominal incisures pale. Head with palpi pale testaceous, mandibles fulvous, clypeus subelevated and



apically rounded. Antennae longer than half body, pale testaceous basally beneath. Metanotal areae distinct and costulae entire. Abdomen piceous or black with apices of all segments testaceous or flavous, and the second to third subimpressed; basal segment punctulate, margined, not petiolate, gradually a little explanate throughout, with subdistinct carinae.

Legs pale testaceous with coxae basally, the hind femora centrally and their tarsi, subinfusate. Stigma infusate and triangular, areolet pentagonal, nervellus intercepted below centre. Length, 4 mm.

Similar to *G. cinctellus* but with the body more finely punctate, the pleurae very shining, the clypeus and face less convex, the areolet usually complete and the transverse impressions on the basal abdominal segments less conspicuous.

Sweden, France and Germany, where the male has been bred by Brischke (Schr. Phys. Ges. König. 1871, p. 89) "aus *Fenusa*-Larven in Eichenblättern"—referred to *Fenusa pygmaea* by Cameron (i. 298). It has not before been noted in Britain, but I possess half-a-dozen examples from Shere in Surrey in Dr. Capron's collection.

3. *albipes*, Ruthe.

Grypocentrus albipes, Ruthe, Stett. Ent. Zeit. 1855, p. 56; Holmgr. Sv. Ak. Handl. 1855, p. 194, ♂ ♀.

Very shining, subpubescent and black, with palpi white and mandibles rufescent. Head not posteriorly constricted and almost broader than thorax; face smooth and prominent; clypeus subelevated and apically rounded. Antennae basally rufescent beneath. Thorax nitidulous with discal metanotal areae distinct; petiolar area large, smooth and subvertical. Scutellum discally depressed. Abdomen not discally pale-marked; basal segment gradually dilated apically, margined, not short, with somewhat distinct carinae. Legs rufescent with hind coxae basally black-marked above. Wings with stigma large and areolet pentagonal; nervellus intercepted below centre. Length, 4 mm.

Closely allied to *G. cinctellus* but differing in its hardly punctulate and much more shining body, paler legs and the entirely black upper side of the abdomen; it is one of the most nitidulous species of the genus.

On the Continent it is recorded from Germany, Sweden and France. Bridgman introduced this species as British (Trans. Ent. Soc. 1882, p. 158) under the erroneous name *G. incisulus*, Ruthe, an account of a specimen he took near Norwich in August, 1877; the same insect is referred to "*G. albipes* or a new species" by Thomson, to whom it was sent (*loc. cit.* 1886, p. 359); but doubt of its identity appears to have been subsequently eliminated, for we find Bridgman writing (Trans. Norf. Soc. 1893, p. 62) of *Fenusa pumilio*, "from this sawfly I have bred a small Ichneumon, *Grypocentrus albipes*, R.;" and again (*l. c.* 1894, p. 627) "Bred from *Fenusa pumilio*" and taken at Lakenham and Earlham in Norfolk. I have a female from Shere in Capron's collection.

4. *anomalus*, Brisch.

Grypocentrus anomalus, Brisch. Schr. Phys. Ges. König. 1871, p. 89, ♂; Schr. Nat. Ges. Danz. 1878, p. 94, ♂ ♀.

A black and shining species, with the abdomen centrally red and clypeus apically flavous. Antennae as long as head and thorax, with the scape red beneath. Metathorax short with indistinct areae. Scutellum black. Abdomen also black with the third to fifth segments red, often black-marked in the ♂; basal segment punctate, almost shorter than broad; second dull and finely punctulate. Anterior legs red with the

coxae black; hind ones black with apices of their trochanters, base of their tibiae and of their tarsi red; all the tarsal claw-joints black. Wings with radix stramineous, stigma piceous and areolet wanting. Length, 3 mm.

This insect was bred in Prussia by Brischke "aus *Fenusa*-Larven in Eichenblättern." In Britain it has been captured by Bridgman (Trans. Norf. Soc. 1894, p. 627) at both Earlham and Brundall in Norfolk.

ADELOGNATHUS, Holmgren.

Holmgr. Sv. Ak. Handl. 1855, p. 196.

Head subbuccate with vertex centrally emarginate, transverse, but temples as broad as eyes; clypeus distinctly discreted, convex and apically truncate; labrum exerted; mandibular teeth of subequal length; cheeks short and subbuccate. Antennae shorter than body with about twelve flagellar joints, of which the first is always longer than the second, and the apical are incrassate-fusiform; pedicellus short; scape not cylindrical. Thorax short and coarctate, with usually short notauli; mesosternum with no lateral sulci; metathorax declived nearly from its base, rarely with any entire areae, areola and costulae wanting. Abdomen not compressed, somewhat broad and usually ovate; basal segment deplanate, gradually constricted basally, margined, with postcentral spiracles; second with oblique thyridii; terebra straight and usually a little exerted. Legs not slender; hind tibiae stout and basally constricted; calcaria very short. Wings subample with areolet wanting or subpentagonal; stigma large; radial cell short; discoidal cell apically acute below; nervellus oblique, subantefurcal and intercepted.

This genus was differentiated from *Grypocentrus* by Holmgren by its elongately exerted labrum, and placed by him in the Tryphoninae; and, whatever their true position, these two genera appear too naturally allied to be very broadly dissociated. Thomson dealt of the present genus in 1883 as an aberrant group of the Tryphoninae, merely remarking upon its connection with *Plectiscus*; but five years later he divided his group *Plectiscina* into the *Adelognathides* and *Plectiscides*, and this group has more recently been erected into a Subfamily of equal dignity with the Tryphoninae and Ophioninae by Szépligeti, who is not (I am glad to see) followed by Schmiedeknecht. That *Adelognathus* is structurally closely allied to *Plectiscus* there is no room for doubt; that the former belongs to the Tryphoninae, both on account of the deplanate abdomen with its hardly exerted terebra and its Tenthredinid host, appears certain; the latter has scarcely ever been bred, but the elongately petiolate abdomen with its strongly exerted terebra and often compressed ♀ structure is distinctly Ophionid. For the relation of *Adelognathus* to the Cryptinae, from which the lack of any mesosternal sulci distinguishes them, cf. Ichn. Brit. ii. 102.

Table of Species.

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|------|----|---|----|----|-------------------------|
| (6). | 1. | Petiole broad; third segment not at all rufescent. | | | |
| (5). | 2. | Antennae longer than half body; anus entirely testaceous. | | | |
| (4). | 3. | Prothorax and frontal orbits partly stramineous | .. | .. | .. I. PALLIDIPES, Grav. |

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|------|----|---|-------------------------|
| (3). | 4. | Prothorax and frontal orbits entirely black | 2. CHRYSOPYGUS, Grav. |
| (2). | 5. | Antennae shorter than half body; anus not entirely pale | 3. BREVICORNIS, Holmgr. |
| (1). | 6. | Petiole sublinear; third segment discally rufescent | 4. DORSALIS, Grav. |

1. pallidipes, Grav.

Plectiscus pallipes, Gr. I. E. ii. 981, ♀. *Adelognathus Ruthiei*, Holmgr. Sv. Ak. Handl. 1855, p. 198, ♂ ♀, pl. viii, fig. 13; Brisch. Schr. Ges. Phys. König. 1871, p. 89, ♂ ♀. *A. pallipes*, Thoms. O. E. ix. 878 et xix. 1277, ♂ ♀ (nec Holmgr.).

Head as broad as thorax, not constricted behind eyes; mouth, clypeus, whole face and the frontal orbits, pale stramineous; frons convex, black with a triangular glabrous area; face parallel-sided and centrally subconvex; clypeus not discreted, apically subtruncate; labrum elongately exerted, flavous and apically rounded; mandibles flavous, gradually constricted to their infusate apices; palpi elongate and pale. Antennae filiform, slender, longer than half body and hardly stouter apically, with the two basal flagellar joints of equal length; infusate with the scape pale and flagellum rufescent beneath; of ♂ entirely pale basally, with 8th—10th joints bearing elevated lines. Thorax stout, shining, with mesonotum finely and sparsely punctulate; prothorax of ♂ entirely, and of ♀ partly, stramineous; notauli distinct and pleurae strongly nitidulous; metathorax short, shining, with no discal areae but the petiolar in ♂ nearly complete and in ♀ apically indicated; spiracular areae not discreted. Scutellum a little convex, of ♂ often red. Abdomen subovate or subtriangular, strongly nitidulous and black, becoming more or less broadly testaceous in ♀ from its fourth or fifth segment, of ♂ with only apices of segments pale; basal segment very smooth, deplanate, gradually dilated apically, with spiracles a little beyond centre; second smooth with an oblique impressed line on either side at its base; 3rd to 5th often with sparse, deep punctures; venter stramineous. Legs normal, entirely pale with the apical tarsal joint alone infusate; hind tibiae subincrassate, basally constricted, with short calcaria. Wings subample; areolet wanting, radial nervure apically subcurved, nervellus oblique and hardly intercepted. Length, 3—4 mm.

In 1888, since when little or nothing has appeared upon this genus, Thomson regarded it as distinct from all other species in the pale face, clypeus and only lower frontal orbits, lack of areolet, slender but distinct epicnemial, comparatively long antennae with their postannellus more than double length of scape, not discreted spiracular areae, smooth second segment and broad petiole.

It is probably as common in France and Germany as Holmgren describes it in Sweden; and Brischke says (Schr. Nat. Ges. Danz. 1878, p. 95) of it "Ich erzog diese Art aus einer Larve von *Emphytus filiformis*. Am 18 Juni kamen aus derselben weissliche Maden, welche sich am 21, jede besonders, ein derbes, gelb-braunes Cocon spannen, Anfangs Juli schlüpften die Wespen aus." It was recorded from Britain in both Marshall's catalogues, I know not upon what authority as the only one in his collection is misnamed under the next species; but I possess several in

that of Dr. Capron from the neighbourhood of Shere in Surrey; Marshall took a female at Nunton in Wilts; and I captured a female in a Lyndhurst garden on 12th July, 1907, in the New Forest.

2. *chrysopygus*, Grav.

Hemiteles chrysopygus, Gr. I. E. ii. 839; Tasch. Zeits. Ges. Nat. 1865, p. 121; Brisch. Schr. Nat. Ges. Danz. 1881, p. 347, ♀. *Adelognathus pallipes*, Holmgr. Sv. Ak. Handl. 1855, p. 198, ♂ ♀. *A. chrysopygus*, Thoms. O. E. xii. 126, nec ix. 879; Schm. Term. Füz. 1897, pp. 118, 127, 527, ♂ ♀.

Head with the clypeus, mouth and whole of the parallel-sided face whitish; mandibles small and short, frons entirely black. Antennae slender, filiform, subincrassate apically and a little longer than half body. Thorax black, with notauli short but distinct and a flavous mark below radices; metathorax very strongly convex and very coarsely rugose with no distinct costae. Abdomen ovate or subtriangular, broadly petiolate and shining; fourth segment apically and anus thence entirely fulvous; basal segment gradually dilated apically, twice longer than broad, with spiracles a little beyond centre; postpetiole aciculate, parallel-sided and discally bicarinate; second smooth, nitidulous and basally deeply foveate; terebra black and shortly exerted. Legs normal, pale fulvous and basally stramineous, with hind coxae sometimes basally infusate; hind tibiae stout and basally constricted. Wings hyaline, stigma stramineous, radix and tegulae white; areolet entirely wanting; nervellus intercepted below centre. Length, 3 mm.

This species agrees with *A. pallidipes*, Gr., in its sparsely punctulate mesonotum, deeply impressed punctures on segments three to five and in the entirely rufescent anus, but differs in its entirely black frontal orbits, etc.; at first Thomson thought the areolet present, but later he agreed with Marshall (in MS.) that it was entirely wanting.

It has been recorded from Silesia, Prussia and Sweden. Bridgman first mentioned it in Britain, with no note of its novelty (Trans. Norf. Soc. 1894, p. 627), from Earlham in Norfolk; and there are two in Marshall's collection from Bugbrooke in Northants and Bishops Teignton in Devon, but in both these the metanotum is strongly nitidulous, hardly punctate with but apical indications of petiolar area, and not as described above by Taschenberg from the type, which may have been dirty.

3. *brevicornis*, Holmgr.

Adelognathus brevicornis, Holmgr. Sv. Ak. Handl. 1855, p. 197; Brisch. Schr. Nat. Ges. Danz. 1878, p. 95, ♂ ♀; cf. *lib. cit.* 1892, p. 40 et Morl. E. M. M. 1907, p. 274.

Head not constricted posteriorly, finely and sparsely punctulate; mouth, the discreted clypeus and centre of ♀ face flavous, ♂ also with whole face and cheeks concolorous. Antennae stout, hardly longer than head and thorax, gradually subincrassate apically, infusate and becoming basally testaceous beneath with ♂ scape flavous. Thorax stout, shining and finely punctate; notauli distinct and pleurae glittering; metanotal areae entirely wanting, the petiolar apically indicated on either side; ♂ with prothoracic margin and a mark before the concolorous tegulae flavous, ♀

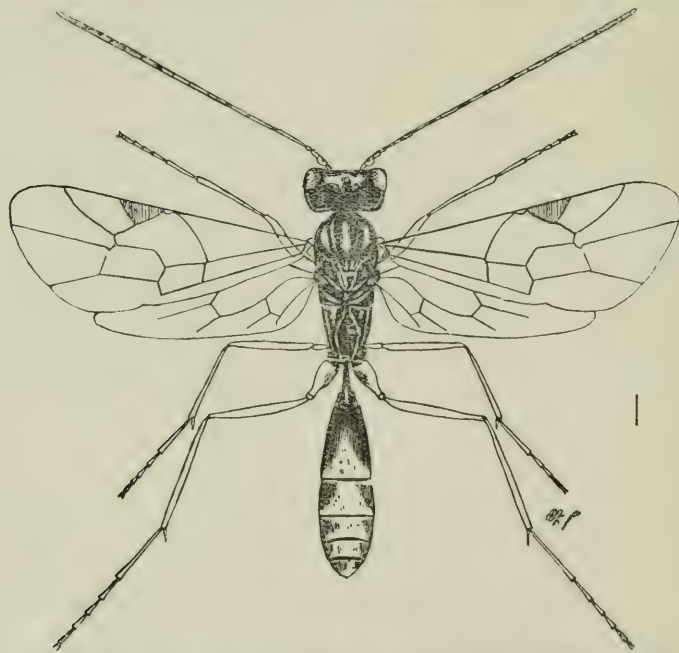
with a concolorous mark below radices. Abdomen strongly nitidulous; venter and in ♂, though rarely in ♀, the apical margins of all the segments flavidous; basal segment deplanate, dilated throughout; the second very smooth and shining, basally obliquely impressed; terebra shortly exerted. Legs normal, pale testaceous; ♂ coxae and trochanters flavidous, ♀ with hind coxae often basally infusate; hind tibiae stout, basally constricted. Areolet often entire and pentagonal, sometimes externally obsolete. Length, 3—4 mm.

Known only from Prussia and Sweden, where it appears to be locally not infrequent. It was brought forward by me as new to Britain in 1907 (*loc. cit.*), since I had swept a single female on 25th June of that year at Marvell Copse near Newport, in Isle of Wight.

4. *dorsalis*, Grav.

Hemiteles dorsalis, Gr. I. E. ii. 838, excl. ♀; cf. Tasch. Zeits. Ges. Nat. 1865, p. 127. *Adelognathus (Pammicrus) dorsalis*, Thoms. O. E. ix. 880, ♂ ♀; cf. *lib. cit.* xii. 1278 et Schm. Term. Füz. 1897, pp. 118 et 527.

A black and shining species, with rufescent central abdominal plaga. Head distinctly punctate in both sexes, vertex transverse but temples as



broad as eyes; mouth, the discreted clypeus and centre of face pale stramineous in both sexes. Antennae filiform, apically fusiform, infusate, with scape stramineous and flagellum ferrugineous beneath; ♂ with elevated lines on the ninth and tenth antennal joints. Thorax shining black; metathorax coarsely transrugose with no distinct costae (Tasch.)

or finely punctulate with the petiolar area elongate and discreted (Thoms.). Abdomen petiolate, ovate in both sexes and broadest apically, shining and nearly glabrous; basal segment somewhat slender, gradually a little explanate apically, with spiracles beyond centre; postpetiole short and parallel-sided, obsoletely sulcate and bicarinate discally, of ♂ narrower and very slightly explanate; second segment very finely punctulate with a larger or smaller discal mark or whole dorsum rufo-castaneous; the following discally concolorous, with ♀ anus entirely stramineous; terebra shortly exerted, infusate and reflexed. Legs fulvous or pale stramineous with tibiae, trochanters and anterior coxae paler; hind coxae often basally infusate. Wings ample and hyaline; stigma pale piceous, radix and tegulae white; areolet pentagonal or subtriangular, sessile; nervellus opposite, geniculate and intercepted at its lower third. Length, $3\frac{1}{2}$ — $4\frac{1}{4}$ mm.

Thomson differentiates it from all the other species of the genus by the elongate, carinate and nearly linear petiole with spiracles at its apical third, the lack of areolet (*nec* Grav. *supra*), black face with epistoma pale in both sexes (Grav.'s ♀ had the face black) and the not at all exerted terebra. Taschenberg says the ♂ in coll. Grav. looks like a ♀ lacking terebra. In my specimens the areolet is entirely wanting, the terebra does not extend to the anus, the large petiolar area is transversely sculptured, the small and indistinct areola is rough and the confluent lateral areae are sparsely and finely punctate. The abdominal plaga is conspicuous and resembles that of *Panargyrops acerus*, but the ovate abdomen is more like that of ♀ *P. tenuipes* (Ichn. Brit. ii. 102).

It is only recorded from Silesia and Sweden. With us it is certainly rare; first introduced by Bridgman (Trans. Ent. Soc. 1889, p. 433), who says Dr. Capron had taken a female and several males about Shere in Surrey; these six examples are now in my collection with a couple of females I took on 9th July, 1909, in the New Forest by sweeping bracken at Burley and on 15th September, 1910, at Covehithe Broad—probably walking on mud at roots of reeds—on the Suffolk coast.

Catalogue.

A CLASSIFIED LIST OF THE BRITISH TRYPHONINAE AS ENUMERATED
IN THIS VOLUME.

Order. HYMENOPTERA.

Section. ICHNEUMONIDEA.

Family. ICHNEUMONIDAE.

Sub-Family. TRYPHONINAE.

Tribe. METOPIIDES

METOPIUS, *Panz.*

1. *dentatus, Fab.*
2. *micratorius, Fab.*
3. *fuscipennis, Wesm.*
4. *dissectorius, Pz.*
5. *peltator, Marsh.*

Tribe. SPHINCTIDES

SPHINCTUS, *Grav.*

1. *serotinus, Grav.*

Tribe. EXOCHIDES.

Sub-tribe. Exochini.

COLPOTROCHIA, *Holmgr.*

1. *elegantula, Schr.*

CHORINÆUS, *Holmgr.*

1. *cristator, Grav.*
2. *funebrius, Grav.*
3. *flavipes, Bridg.*
4. *longicornis, Thoms.*
5. *tricarinatus, Hlg.*
6. *talpa, Hal.*
7. *asper, Grav.*

HYPERACMUS, *Holmgr.*

1. *crassicornis, Grav.*

MICROLEPTES, *Grav.*

1. *splendidulus, Grav.*

POLYCLISTUS, *Först.*

1. *femoralis, Fourc.*
2. *mansuetor, Grav.*
3. *flavipes, Ratz.*

PERIOPE, *Hal.*

1. *auscultator, Hal.*

EXOCHUS, *Grav.*

1. *podagricus, Grav.*
2. *pallidipes, Holmgr.*
3. *nitidifrons, Thoms.*
4. *curvator, Fab.*
5. *globulipes, Desv.*
6. *longicalcar, Thoms.*
7. *congener, Holmgr.*
8. *spiracularis, Thoms.*
9. *aethiops, Grav.*
10. *lativentris, Thoms.*
11. *antiquus, Hal.*
12. *niger, Bridg.*
13. *squalidus, Holmgr.*
14. *gravipes, Grav.*
15. *gravis, Grav.*
16. *Britannicus, Morl.*
17. *prosopius, Grav.*
- 17a *intermedius, Morl.*
18. *nigripalpis, Thoms.*
19. *flavomarginatus, Holmgr.*
20. *pictus, Holmgr.*
21. *erythronotus, Grav.*
22. *decoratus, Holmgr.*
23. *alpinus, Zett.*
24. *notatus, Holmgr.*
25. *lentipes, Grav.*
26. *tibialis, Holmgr.*
27. *Fletcheri, Bridg.*
28. *parvispina, Thoms.*
29. *septentrionalis, Holmgr.*
30. *albicinctus, Holmgr.*

*Sub-tribe. Orthocentrini.*ORTHOCENTRUS, *Grav.*

1. stigmaticus, *Holmgr.*
2. corrugatus, *Holmgr.*
3. marginatus, *Holmgr.*
4. frontator, *Zett.*
5. sannio, *Holmgr.*
6. monilicornis, *Thoms.*
7. attenuatus, *Holmgr.*
8. petiolaris, *Thoms.*
9. fulvipes, *Grav.*
10. radialis, *Thoms.*
11. protuberans, *Holmgr.*

PICROSTIGEUS, *Thoms.*

1. anomalus, *Holmgr.*

STENOMACRUS, *Thoms.*

1. flaviceps, *Grav.*
2. caudatus, *Holmgr.*
3. incisus, *Grav.*
4. curvicaudatus, *Brisch.*
5. concinnus, *Holmgr.*
6. deletus, *Thoms.*
7. laricis, *Hal.*
8. ridibundus, *Grav.*
9. ventralis, *Holmgr.*
10. agilis, *Holmgr.*
11. confinis, *Holmgr.*
12. intermedius, *Holmgr.*
13. cognatus, *Holmgr.*
14. exerens, *Thoms.*
15. affinis, *Zett.*
16. pusillus, *Zett.*
17. binotatus, *Holmgr.*
18. cubiceps, *Thoms.*
19. silvaticus, *Holmgr.*

*Tribe. BASSIDES.*BASSUS, *Fall.*

1. laetatorius, *Fab.*
2. tricinctus, *Grav.*
3. multicolor, *Grav.*
4. albosignatus, *Grav.*
5. variicoxa, *Thoms.*
6. annulatus, *Grav.*

HOMOCIDUS, *Morl.*

1. cinctus, *Grav.*
2. bizonarius, *Grav.*

HOMOCIDUS—*continued.*

3. obscuripes, *Holmgr.*
4. pectoratorius, *Grav.*
5. caudatus, *Thoms.*
6. punctiventris, *Thoms.*
7. biguttatus, *Grav.*
8. abdominator, *Bridg.*
9. flavolineatus, *Grav.*
10. tarsatorius, *Panz.*
11. fissorius, *Grav.*
12. ornatus, *Grav.*
13. deplanatus, *Grav.*
14. niger, *Morl.*
15. Sundevalli, *Holmgr.*
16. dimidiatus, *Schr.*
17. pictus, *Grav.*
18. incisus, *Thoms.*
19. reflexus, *Morl.*
20. crassicus, *Thoms.*
21. longiventris, *Thoms.*
22. strigator, *Fab.*
23. xanthaspis, *Thoms.*
24. emarginatus, *Morl.*
25. elegans, *Grav.*
26. pallidipes, *Grav.*
27. pulcher, *Holmgr.*
28. signatus, *Grav.*
29. hygrobius, *Thoms.*

ZOOTREPHUS, *Thoms.*

1. rufiventris, *Grav.*

PROMETHUS, *Thoms.*

1. sulcator, *Grav.*
2. albicoxis, *Thoms.*
3. scutellaris, *Bridg.*
4. Dodsi, *Morl.*
5. cognatus, *Holmgr.*
6. laticarpus, *Thoms.*
7. pulchellus, *Holmgr.*
8. dorsalis, *Holmgr.*
9. festivus, *Fab.*

PHTHORIMUS, *Först.*

1. compressus, *Desv.*
2. anomalus, *Morl.*

TRICHOMASTIX, *Voll.*

1. flavipes, *Holmgr.*

Tribe. **TRYPHONIDES.**Sub-tribe. **Tryphonini.****LABROSSYTA**, Först.

1. scotoptera, Grav.

SPHECOPHAGA, Westw.

1. vesparum, Curt.

PROTARCHUS, Först.

1. rufus, Grav.

MESOLEIUS, Holmgr.

1. virgultorum, Grav.
2. ustulatus, Desv.
3. sepulchralis, Holmgr.
4. colon, Grav.
5. pini, Bridg.
6. brachyacanthus, Parf.
7. vepretorum, Grav.
8. semicaligatus, Grav.
9. fallax, Holmgr.
10. erythrocerus, Grav.
11. rufolabris, Zell.
12. bicolor, Grav.
13. rufonotatus, Holmgr.
14. nigricollis, Grav.
15. dorsalis, Grav.
16. elegans, Parf.
17. hamulus, Grav.
18. ignavus, Holmgr.
19. tenuiventris, Holmgr.
20. armillatorius, Grav.
21. scapularis, Steph.
22. molestus, Holmgr.
23. aulicus, Grav.
24. axillaris, Steph.
25. caligatus, Grav.
26. variegatus, Jur.
27. segmentator, Holmgr.
28. haematodes, Grav.
29. maculicollis, Steph.
30. sternoxanthus, Grav.
31. dubius, Holmgr.
32. furax, Holmgr.
33. octicus, Grav.
34. formosus, Grav.
35. caninae, Bridg.
36. filicornis, Holmgr.
37. pyriformis, Ratz.
38. multicolour, Grav.
39. niger, Grav.
40. renovatus, Morl.
41. compressiusculus, Thoms.

DYSPETES, Först.

1. praerogator, Linn.

TREMATOPYGUS, Holmgr.

1. lativentris, Holmgr.
2. albipes, Grav.
3. vellicans, Grav.
4. erythropalpus, Gmel.
5. atratus, Holmgr.

TRYPHON, Fall.

1. elongator, Fab.
2. brachyacanthus, Gmel.
3. helophilus, Grav.
4. exclamatoris, Grav.
5. ephippium, Holmgr.
6. rutilator, Linn.
7. trochanteratus, Holmgr.
8. vulgaris, Holmgr.
9. signator, Grav.
10. nigripes, Holmgr.
11. consobrinus, Holmgr.
12. brunniventris, Grav.
13. compunctor, Grav.

OTOBLASTUS, Först.

1. luteomarginatus, Grav.

Sub-tribe. **Cteniseini.****EXYSTON**, Schiöd.

1. cinctulum, Grav.
2. brevipetiolatum, Thoms.
3. subnitidum, Grav.

ACROTOMUS, Holmgr.

1. alacer, Grav.
2. ridibundus, Grav.
3. lucidulus, Grav.
4. laticeps, Grav.
5. sexcinctus, Grav.
6. succinctus, Grav.
7. mesoleptoides, Steph.

SMICROPLECTRUS, Thoms.

1. jucundus, Holmgr.
2. quinquecinctus, Grav.

DIABORUS, Först.

1. lituratorius, Linn.

EXENTERUS, *Htg.*

1. Curtisi, *Hal.*
2. elegans, *Steph.*
3. marginatorius, *Fab.*
4. gnathoxanthus, *Grav.*
5. pachysoma, *Steph.*
6. phaeorrhoeus, *Hal.*
7. pictus, *Grav.*
8. basalis, *Steph.*
9. flavilabris, *Holmgr.*
10. aurifluus, *Hal.*
11. hostilis, *Holmgr.*
12. exstirpatorius, *Holmgr.*
13. limbatellus, *Holmgr.*
14. mitigosus, *Grav.*
15. lineola, *Steph.*
16. bimaculatus, *Holmgr.*

TRICAMPTUS, *Först.*

1. apiarius, *Grav.*

*Sub-Tribe. Mesoleptini.*MESOLEPTUS, *Grav.*

1. indefessus, *Grav.*
2. bipunctatus, *Grav.*
3. paludicola, *Holmgr.*
4. typhae, *Fourc.*
5. villosulus, *Thoms.*
6. fugax, *Grav.*
7. xanthostigma, *Grav.*
8. vulneratus, *Zett.*
9. testaceus, *Fab.*
10. ruficornis, *Grav.*
11. attenuatus, *Bridg.*
12. cingulatus, *Grav.*
13. prosobleucus, *Grav.*
14. leptocerus, *Grav.*
15. macrodactylus, *Holmgr.*
16. sordidus, *Grav.*
17. glacialis, *Woldst.*

PERISPUDUS, *Thoms.*

1. sulphuratus, *Grav.*
2. facialis, *Grav.*

CATOGLYPTUS, *Holmgr.*

1. fortipes, *Grav.*
2. antilope, *Grav.*
3. delusor, *Linn.*
4. fuscicornis, *Gmel.*

EURYPROCTUS, *Holmgr.*

1. annulatus, *Grav.*
2. nemoralis, *Fourc.*
3. alpinus, *Holmgr.*
4. mundus, *Grav.*
5. geniculosus, *Grav.*
6. defectivus, *Grav.*
7. atomator, *Müll.*
8. chrysostomus, *Grav.*
9. nigriceps, *Grav.*
10. minutus, *Bridg.*
11. albopictus, *Grav.*
12. xanthostomus, *Grav.*
13. lateralis, *Grav.*
14. notatus, *Grav.*

NOTOPYGUS, *Holmgr.*

1. emarginatus, *Holmgr.*

PERILISSUS, *Holmgr.*

1. filicornis, *Grav.*
2. lutescens, *Holmgr.*
3. rufoniger, *Grav.*
4. pallidus, *Grav.*
5. spilonotus, *Steph.*
6. orbitalis, *Grav.*
7. triangulatus, *Bridg.*
8. naevius, *Gmel.*
9. erythrocerus, *Grav.*
10. buccinator, *Holmgr.*
11. luteolator, *Grav.*
12. pictilis, *Holmgr.*
13. minutus, *Bridg.*

ECLYTUS, *Holmgr.*

1. ornatus, *Holmgr.*
2. fontinalis, *Holmgr.*

*Sub-Tribe. Ctenopelmini.*CTENOPELMA, *Holmgr.*

1. mesoxantha, *Grav.*
2. xanthostigma, *Holmgr.*
3. nigra, *Holmgr.*

SCOLOBATES, *Grav.*

1. auriculatus, *Grav.*

TACHYPORTHUS, *Först.*

1. italicus, *Grav.*

PRIONOPODA, *Holmgr.*

1. stictica, *Fab.*
2. xanthopsana, *Grav.*
3. glabra, *Bridg.*

LATHROLESTUS, *Thoms.*

1. macropygus, *Holmgr.*
2. bipunctatus, *Bridg.*
3. marginatus, *Thoms.*
4. unguularis, *Thoms.*

EUCEROS, *Grav.*

1. crassicornis, *Grav.*
2. serricornis, *Hal.*
3. unifasciatus, *Voll.*
4. albitarsis, *Curt.*

MONOBLASTUS, *Htg.*

1. Neustriæ, *Schr.*
2. palustris, *Holmgr.*
3. exstirpatorius, *Grav.*
4. chrysopus, *Gmel.*
5. longicornis, *Holmgr.*

POLYBLASTUS, *Htg.*

1. annulicornis, *Gir.*
2. parvulus, *Grav.*
3. Bridgmani, *Parf.*
4. uncinatus, *Bridg.*
5. variitarsus, *Grav.*
6. cothurnatus, *Grav.*
7. sphaerocephalus, *Grav.*
8. pastoralis, *Grav.*

POLYBLASTUS—*continued.*

9. pratensis, *Grav.*
10. rivalis, *Holmgr.*
11. marginatus, *Holmgr.*
12. pinguis, *Grav.*
13. Westringi, *Holmgr.*
14. sanguinatorius, *Ratz.*
15. Wahlbergi, *Holmgr.*
16. subalpinus, *Holmgr.*
17. melanostigmus, *Holmgr.*
18. pyramidatus, *Holmgr.*
19. bidentatus, *Steph.*

ERROMENUS, *Holmgr.*

1. calcator, *Müll.*
2. plebejus, *Woldst.*
3. brunnicans, *Grav.*
4. zonarius, *Grav.*
5. punctulatus, *Holmgr.*
6. frenator, *Grav.*
7. analis, *Brisch.*
8. fasciatus, *Grav.*

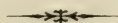
GRYPOCENTRUS, *Ruthe.*

1. cinctellus, *Ruthe.*
2. incisulus, *Ruthe.*
3. albipes, *Ruthe.*
4. anomalus, *Brisch.*

ADELOGNATHUS, *Holmgr.*

1. pallidipes, *Grav.*
2. chrysopygus, *Grav.*
3. brevicornis, *Holmgr.*
4. dorsalis, *Grav.*

INDEX OF SYNONYMS, ETC.



ACROTOMUS.

coarctatus, Holmgr.	..	199
insidiator, Holmgr.	..	178
laetus, Grav.	..	194, 208
orbitatorius, Brisch.	194,	217
xanthopus, Holmgr.	..	194

ADELOGNATHUS.

nanus, Marsh.	..	278
pallipes, Holmgr.	..	317
pallipes, Thoms.	..	316
Ruthei, Holmgr.	..	316

AELOMETIS.

italicus, Thoms.	..	272
------------------	----	-----

AGLYPHUS, Gir.

.. 272

ALCOCERUS, Först.

.. 30

ALEXETER.

fallax, Thoms.	..	147
----------------	----	-----

AMESOLYTUS, Först.

.. 30

ANIAROPHRON, Först.

89, 114

ANOMALON.

curvator, Trentep.	..	25
delusor, Trentep.	..	236
laetatorius, Jur.	..	82
mandator, Jur.	..	13
sponsorius, Jur.	..	252
variegatum, Jur.	..	159
vesparum, Curt.	..	133

ASTHENARUS.

delusor, Thoms.	..	236
-----------------	----	-----

BARYTARBUS.

colon, Thoms.	..	143
virgultorum, Thoms.	..	140

BASSUS.

abdominator, Bridg.	..	95
affinis, Zett.	..	75
albosignatus, var. 1, Grav.	..	86
albosignatus, var. 2, Grav.	..	87
albosignatus, var. 4, Grav.	..	84
albovarius, Woll.	..	82
albicinctus, Desv.	..	89
alpinus, Zett.	..	47
amictorius, Pz.	..	205
areolatus, Holmgr.	..	117
athaliaeperda, Curt.	..	166
biguttatus, Grav.	..	94
bimaculatus, Holmgr.	..	96
bizonarius, Grav.	..	90
cinctus, Grav.	..	89
cingulatus, Holmgr.	..	90
cognatus, Holmgr.	..	120
compressus, Desv.	..	124
confusus, Woldst.	..	94
deletus, Thoms.	..	85
deplanatus, Grav.	99,	100
deplanatus, var., Grav.	..	94
Desvignesii, Marsh.	..	97
dimidiatus, Holmgr.	..	102
dorsalis, Holmgr.	..	122
elegans, Grav.	..	109
erythrocerus, Zett.	..	147
exsultans, Grav.	..	97
exsultans, var. 3, Grav.	..	120
festivator, Grav.	..	123
festivus, Grav.	..	123
festivus, var. 2 et 3, Grav.	..	121
festivus, Zett.	..	117
fissorius, Grav.	..	98
fissorius, Holmgr.	..	106
flavipes, Holmgr.	..	127
flavolineatus, Grav.	..	90
flavolineatus, Zett.	..	84
flavolineatus, var. b, Zett.	..	85
flavus, Desv.	..	97
frenator, Desv.	..	99
frontalis, Brisch.	..	90
glorimatorius, Pz.	..	98
gracilentus, Holmgr.	112,	120

BASSUS—*continued*.

Holmgreni, Bridg.	..	115
hyperboreus, Marsh.	..	89
ibalioides, Kriech.	..	124
insignis, Grav.	..	97
interruptus, Holmgr.	..	96
laetatorius, Pz.	..	85
lateralis, Grav.	..	89
maculatus, Desv.	..	122
minutus, Zett.	..	76
nemoralis, Holmgr.	..	84
nigricollis, Zett.	..	150
nigritarsus, Grav.	..	109
obscuripes, Holmgr.	..	91
ornatus, Grav.	..	99
pallipes, Grav.	..	111
pectoratorius, Grav.	..	92
peronatus, Marsh.	90,	282
pictans, Desv.	..	109
pictus, Grav.	..	104
planus, Desv.	..	102
pulchellus, Desv.	..	97
pulchellus, Holmgr.	..	121
pulcher, Holmgr.	..	112
pumilus, Holmgr.	104,	106
punctatus, Bridg.	..	98
pusillus, Zett.	..	75
rufipes, Grav.	..	94
ruficornis, Holmgr.	107,	108
rufiventris, Grav.	115,	289
rufocinctus, Desv.	..	91
rufolabris, Zett.	..	148
rufonotatus, Holmgr.	..	109
remotus, Marsh.	..	90
scabriculus, Holmgr.	..	89
scabrosus, Desv.	..	101
scutellaris, Bridg.	..	119
signatus, Grav.	..	112
strigator, Grav.	..	107
sulcator, Grav.	..	117
sulcator, varr. 3 <i>et</i> 4, Grav.	121	
sulcator, var. 5, Grav.	118,	120
Sundevalli, Holmgr.	..	101
tarsatorius, Pz.	..	97
testaceus, Fab.	..	224
thoracicus, Desv.	..	104
tibialis, Bridg.	..	127
tripicticus, Walsh.	..	82
venustulus, Sauss.	..	82

BIOBLAPSIS, Först. .. 126

CACOTROPA.

sericea, Thoms. .. 133

CALLIDIOTES.

coxator, Grav.	..	216
luridator, Grav.	..	216
properator, Hal.	..	216
ventrator, Grav.	..	216

CAMPOPLEX.

costulatus, Bridg.	..	200
--------------------	----	-----

CATOGLYPTUS.

crassipes, Holmgr.	..	234
foveolator, Holmgr.	..	237
grossipes, Thoms.	..	234
montanus, Holmgr.	..	237
pulchricornis, Holmgr.	..	235
scaber, Brisch.	..	234

CHORINAEUS.

asper, var., Bridg.	..	20
brevicalcar, Thoms.	..	18
subcarinatus, Holmgr.	..	16

COELOCONUS, Först. .. 178

COLPOTROCHIA.

affinis, Voll.	..	13
----------------	----	----

COSMOCONUS, Först. .. 178

CRYPTOPIMPLA.

blanda, Grav.	..	137, 251
4-lineata, Grav.	..	137

CRYPTUS.

curvator, Fab.	..	36
mandator, Fab.	..	13
marginatorius, Fab.	..	205
regenerator, Fab.	..	241
sticticus, Fab.	..	274

CTENISCUS

apiarius, Brisch.	..	214
aurifluus, Hal.	..	210
bimaculatus, Brisch.	..	213
cingulatorius, Marsh.	..	90
colorator, Brisch.	..	206
Curtisii, Hal.	..	204
erosus, Brisch.	..	200
extirpatorius, Brisch.	..	287
gnathoxanthus, Brisch.	..	206
jucundus, Bridg.	..	200
limbatellus, Brisch.	211,	270
limbatus, Brisch.	..	212
lineiger, Thoms.	..	211

CTENISCUS—*continued.*

	PAGE
marginatorius, Brisch. . .	205
phaeorrhoeus, Hal. . .	207
pictus, Brisch. . .	207
sexcinctus, Brisch. . .	197
succinctus, Brisch. . .	198
ustulatus, Thoms. . .	209

CTENOPELMA.

lapponica, Holmgr. . .	270
lutea, Holmgr. . .	271
rufiventris, Grav. . .	270

DELOTOMUS.

coarctatus, Thoms. . .	199
laticeps, Thoms. . .	196
lucidulus, Thoms. . .	196

DIMORPHA.

cognata, Brisch. . .	216
----------------------	-----

DIPLAZON, Grav. . .

EARINUS.

gloriorius, Panz. . .	98
-----------------------	----

ECCLINOPS.

orbitalis, Thoms. . .	259
pallidus, Thoms. . .	258
subcinctus, Thoms. . .	258

ENIZEMUM, Först. . .

ERADHA, Cam. . .

ERROMENUS.

proditor, Marsh. . .	298
Oelandicus, Thoms. . .	306

EUCERUS.

egregius, Holmgr. . .	282
grandicornis, Holmgr. . .	282
morianellus, Holmgr. . .	280
pruinus, DT. . .	280

EUMESIUS, Westw. . .

EURYPROCTUS.

albipes, Holmgr. . .	242
bisannulatus, Thoms. . .	244
bivinctus, Holmgr. . .	242
crassicornis, Thoms. . .	241
geniculatus, Holmgr. . .	243

EURYPROCTUS—*continued.*

hilarellus, Holmgr. . .	249
regenerator, Holmgr. . .	241
rufoniger, Holmgr. . .	257
sinister, Brisch. . .	250
transfuga, Holmgr. . .	248
tuberculatus, Holmgr. . .	241, 242
varicornis, Thoms. . .	244

EXENTERUS.

apiarius, Schiöd. . .	214
cingulatorius, Holmgr. . .	90
colorator, Holmgr. . .	206
Dahlbomi, Holmgr. . .	213
erosus, Holmgr. . .	200
gibbus, Ratz. . .	201
jucundus, Holmgr. . .	200
limbatus, Holmgr. . .	212
litoratorius, Holmgr. . .	201
lucidulus, Schiöd. . .	196
orbitorius, Schiöd. . .	194
sexcinctus, Schiöd. . .	197
simulatorius, Schiöd. . .	207
succinctus, Holmgr. . .	198
triangulatorius, Holmgr. . .	192
ustulatus, Holmgr. . .	209

EXOCHUS.

annularis, Thoms. . .	48
asper, Grav. . .	20
coronatus, Grav. . .	46
crassicornis, Grav. . .	21
cristator, Grav. . .	16
cylindricus, Holmgr. . .	49
flaviceps, Ratz. . .	27
flavolimbatus, Thoms. . .	45
femoralis, Grav. . .	24
femoralis, Holmgr. . .	25
frenator, Grav. . .	309
fulvipes, Cress. . .	36
funebis, Grav. . .	17
Holmgreni, Boh. . .	37
incidens, Thoms. . .	42
laevigatus, Ratz. . .	34
licitor, Hal. . .	47
maculatus, Brisch. . .	43
mansuetor, Grav. . .	25
pectoralis, Hal. . .	40
procerus, Holmgr. . .	43
prosopius, Holmgr. . .	41
Talpa, Hal. . .	20
tardigradus, Holmgr. . .	42
Woldstedtii, Holmgr. . .	48

EXYSTON.

PAGE

albocinctus, Pfank.	..	191
tricolor, Pfank.	..	191

GLAUSOCENTRUS.

macrodactylus, Thoms.	..	229
sordidus, Thoms.	..	229

GRYPOCENTRUS.

bipunctatus, Bridg.	..	278
clypeatus, Zett.	..	279
lativentris, Holmgr.	..	173
lucidus, Brisch.	..	312

HADRODACTYLUS.

bipunctatus, Pfank.	..	219
femoralis, Thoms.	..	218
fugax, Thoms.	..	222
insignis, Kreich.	..	221
macrodactylus, Thoms.	..	229
paludicola, Thoms.	..	220
seminiger, Thoms.	..	255
villosulus, Thoms.	..	221
vulnerator, Thoms.	..	223
xanthostigma, Thoms.	..	223

HEMITELES.

chrysopygus, Grav.	..	317
dorsalis, Grav.	..	318

HIMERTUS.

bisannulatus, Thoms.	..	244
----------------------	----	-----

HOMOPORUS 87

abdominator, Thoms.	..	95
biguttatus, Thoms.	..	94
bizonarius, Thoms.	..	90
caudatus, Thoms.	..	93
cinctus, Morl.	..	89
crassicus, Thoms.	..	106
deplanatus, Morl.	..	100
dimidiatus, Morl.	..	102
elegans, Thoms.	..	109
fissorius, Thoms.	..	98
flavolineatus, Thoms.	..	96
graculus, Morl.	..	91
hygrobius, Thoms.	..	113
incisus, Thoms.	..	104
lateralis, Thoms.	..	89
longiventris, Thoms.	..	106
niger, Morl.	..	101

HOMOPORUS—continued.

PAGE

nigricornis, Thoms.	..	100
ornatus, Thoms.	..	99
pallipes, Thoms.	..	111
pectoratorius, Thoms.	..	92
pictus, Thoms.	..	102
pulcher, Thoms.	..	112
pumilus, Thoms.	..	104
punctiventris, Thoms.	..	94
reflexus, Morl.	..	105
signatus, Thoms.	..	112
strigator, Morl.	..	107
Sundevalli, Thoms.	..	101
tarsatorius, Thoms.	..	97
xanthaspis, Thoms.	..	108

HOMOTROPUS, Först. .. 87

ICHNEUMON.

albocinctus, Grav.	..	191
amictorius, Pz.	..	205
anodon, Schr.	..	183
armillatorius, Grav.	..	154
atomator, Müll.	..	245
auriculatus, Fab.	..	272
brachyacanthus, Gmel.	..	180
calcator, Müll.	..	245
cepa, Fourc.	..	183
cinctulus, Grav.	..	191
clavator, Schr.	..	224
chrysopus, Gmel.	..	287
chrysopus, Marsham	..	4
chrysostomus, Grav.	..	246
curvator, Fab.	..	36
defectivus, Gr.	..	244
delusor, Linn.	..	236
dentatus, Fab.	..	3
dimidiatus, Schr.	..	102
dissectorius, Pz.	..	8
elegantulus, Schr.	..	13
elongator, Fab.	..	179
erythronotus, Grav.	..	46
erythropalpus, Gmel.	..	175
erythropus, Gmel.	..	306
fasciatus, Fourc.	..	2, 5
femoralis, Fourc.	..	24
festivator, Thunb.	..	123
festivus, Fab.	..	123
filicornis, Grav.	..	255
fuscicornis, Gmel.	..	237
gravipes, Grav.	..	41
insultator, Grav.	..	183
indefessus, Grav.	..	218

ICHNEUMON—*continued*. PAGE

impraegnator, Schr. . .	183
impugnator, Schr. . .	28
laetatorius, Fab. . .	82
leptocerus, Grav. . .	228
lituratorius, Linn. . .	201
lunulatus, Vill. . .	5
mandator, Linn. . .	13
mandibulator, Thunb. . .	171
mansuetor, Grav. . .	25
marginatorius, Fab. . .	205
micratorius, Fab. . .	5
mundus, Grav. . .	242
naevius, Gmel. . .	261
nemoralis, Fourc. . .	241
neustriae, Schr. . .	285
praerogator, Linn. . .	171
pinguis, Grav. . .	300
prosoleucus, Grav. . .	227
5-cinctus, Grav. . .	200
regenerator, Thunb. . .	241
rufoniger, Grav. . .	257
rutilator, Linn. . .	183
scotopterus, Grav. . .	131
semicaligatus, Grav. . .	145
sponsorius, Grav. . .	252
sticticus, Fab. . .	274
strigator, Fab. . .	107
sulphuratus, Grav. . .	231
testaceus, Fab. . .	224
testaceus, Gmel. . .	180
typhae, Fourc. . .	220
variator, Müll. . .	255
variegator, Rossi. . .	5
vernalis, Grav. . .	257
zonarius, Gr. . .	308

IPOCTONUS.

atomator, Thoms. . .	245
abdominator, Thoms. . .	245
chrysostomus, Thoms. . .	240
nigriceps, Thoms. . .	240

LABROCTONUS, Först. . . 270

LAGAROTUS.

erythrocerus, Thoms. . .	147
insolens, Thoms. . .	145
semicaligatus, Thoms. . .	145

LAMACHUS.

silvarum, Thoms. . .	144
----------------------	-----

LAMPRONOTA.

PAGE

caligata, Grav. . .	158
melancholica, Grav. . .	158

LAPAPHRAS, Cam. . . 131

LATHROLESTUS. . . 278

caudatus, Thoms. . .	278
----------------------	-----

LATHROPLEX, Först. . . 210

LIOPSIS, Först. . . 110

LUPHYROSCOPUS.

Gorskii, Thoms. . .	203
nigricollis, Thoms. . .	205
pictilis, Thoms. . .	204

MESOLEIUS.

albipes, Brisch. . .	174
amabilis, Holmgr. . .	151, 157
attenuatus, Bridg. . .	220
Bignellii, Bridg. . .	231
brevispina, Bridg. . .	109
comptus, Holmgr. . .	225
difformis, Holmgr. . .	155
dives, Holmgr. . .	168
dubius, Holmgr. . .	150
erythrogaster, Holmgr. . .	153
facialis, Thoms. . .	232
femorator, Thoms. . .	109
flavopictus, Brisch. . .	217
guttiger, Holmgr. . .	149
insolens, Holmgr. . .	145
languidulus, Holmgr. . .	102
leptogaster, Holmgr. . .	155
melanocephalus, Holmgr. . .	224
naevius, Holmgr. . .	201
napaeus, Holmgr. . .	108
nobilis, Holmgr. . .	152
parvus, Holmgr. . .	101
praerogator, Voll. . .	171
pulchellus, Holmgr. . .	162, 107
rufus, Holmgr. . .	135
ruficornis, Holmgr. . .	225
sanguinicollis, Holmgr. . .	159
solitarius, Holmgr. . .	100
testaceus, Holmgr. . .	224
transfuga, Holmgr. . .	248
unifasciatus, Holmgr. . .	107
vigens, Holmgr. . .	161
xanthostomus, Brisch. . .	240

MESOLEPTUS. PAGE

albolineatus, Grav. . .	216
annulator, Ste. . .	240
annulatus, Grav. . .	240
antilope, Grav. . .	216, 235
arridens, Grav. . .	216, 241, 243
atomator, Grav. . .	245
cerinostomus, Grav. . .	228
chrysostomus, Grav. . .	246
cinctulus, Grav. . .	191
coxator, Grav. . .	216
curtus, Holmgr. . .	223
decipiens, Grav. . .	216
defectivus, Grav. . .	244
delusor, Grav. . .	216, 236
evanialis, Grav. . .	216
exornatus, Grav. . .	217, 265
facialis, Grav. . .	232
femoralis, Holmgr. . .	218
filicornis, Grav. . .	255
flavopictus, Grav. . .	217
fortipes, Grav. . .	234
foveolator, Holmgr. . .	237
fusicornis, Grav. . .	237
Holmgreni, Thoms. . .	227
geniculosus, Grav. . .	243
gracilipes, Curt. . .	217
gracilis, Ste. . .	220
infernalis, Grav. . .	216
laetus, Grav. . .	194, 217
leucostomus, Grav. . .	217
limitaris, Grav. . .	261
lugubris, Woldst. . .	225
luridator, Grav. . .	216
luteolator, Grav. . .	263
marginatus, Bridg. . .	219
melanocephalus, Gr. . .	224
mirabilis, Ste. . .	237
montanus, Grav. . .	237
mundus, Grav. . .	242
narrator, Grav. . .	217, 252
nemoralis, Grav. . .	237, 241
nemoralis, var. 3, Grav. . .	237
pallidus, Grav. . .	258
pectoralis, Grav. . .	217
praetermissus, Woldst. . .	246
quadriannulatus, Grav. . .	216, 217
regenerator, Grav. . .	241
rufiventris, Grav. . .	270
rufocinctus, Grav. . .	249
rufoniger, Grav. . .	257
scutellatus, Bridg. . .	229
seminiger, Grav. . .	255

MESOLEPTUS—continued. PAGE

similis, Brisch. . .	227
speciosus, Curt. . .	217
spheginus, Grav. . .	217
spilonotus, Ste. . .	258
sponsorius, Ste. . .	252
sticticus, Grav. . .	274
subcompressus, Grav. . .	217
submarginatus, Ste. . .	217, 227
suborbitalis, Ste. . .	241
sulphuratus, Grav. . .	231
thoracicus, Ste. . .	217
trimaculatus, Ste. . .	217
typhae, Grav. . .	220, 221
typhae, var. 2, Grav. . .	218
typhae, var. 5, Grav. . .	220
undecimnotatus, Desv. . .	217, 227
ventralis, Curt. . .	260
ventrator, Grav. . .	216
Waltoni, Curt. . .	237
xanthopsanus, Grav. . .	275
xanthostigma, Grav. . .	216

METACOELUS.

femoralis, Holmgr. . .	24
flaviceps, Holmgr. . .	27

METOPIUS.

croceicornis, Thoms. . .	4
interruptus, Thoms. . .	3
necatorius, Grav. . .	5
scrobiculatus, Htg. . .	7
sicarius, Grav. . .	8

MICROPLECTRON . . . 200

quinquecinctus, Pfanck. . .	200
-----------------------------	-----

MONOBLASTUS.

Caproni, Bridg. . .	287, 288
elongator, Htg. . .	179
laevigatus, Holmgr. . .	287
rutilator, Htg. . .	183

MONOPLECTRON.

zygaenator, Holmgr. . .	28
-------------------------	----

NEGELES.

proditor, Grav. . .	298
---------------------	-----

NEMIOBLASTUS.

melanostigma, Thoms. . .	303
--------------------------	-----

NEURATELES.	PAGE
papyraceus, Ratz.	53, 65

NOTHAINA.	
bicarinata, Cam.	.. 21

NOTOPYGUS.	
analıs, Holmgr.	.. 217, 252

OEDEMATOPSIS.	
scabricula, Grav.	.. 266

OLIGOPLECTRON, Först.	28
-----------------------	----

OPHION.	
delusor, Ste.	.. .. 236
festivator, Fab.	.. .. 123

ORTHOCENTRUS.	
affinis, Holmgr.	.. .. 75
agilis, Holmgr.	.. .. 72
anomalus, Grav.	52, 60, 62
binotatus, Grav.	.. .. 53
binotatus, Holmgr.	.. .. 76
caudatus, Holmgr.	.. 66, 67
confinis, Holmgr.	.. .. 73
cognatus, Holmgr.	.. .. 74
concinus, Holmgr.	.. 66, 68
curvicaudatus, Brisch.	.. .. 68
femoralis, Holmgr.	.. .. 77
flaviceps, Grav.	.. .. 66
flaviceps, Holmgr.	.. .. 69
frontalis, Brisch.	.. .. 56
incisus, Grav.	.. .. 53, 67
insularis, Ashm.	.. .. 62
intermedius, Holmgr.	.. .. 73
laricis, Hal.	.. .. 69
merula, Holmgr.	.. .. 75
morianellus, Holmgr.	.. .. 75
ochripes, Holmgr.	.. .. 75
ridibundus, Grav.	.. .. 70
silvaticus, Holmgr.	.. .. 77
spurius, Grav.	.. .. 53
unifasciatus, Bridg.	.. .. 58
varius, Holmgr.	.. .. 63
ventralis, Holmgr.	.. .. 71
vittatus, Holmgr.	.. .. 71

OTITOCHILUS, Först.	.. 178
---------------------	--------

OTLOPHORUS.	
vepretorum, Thoms.	.. 144

PAMMICUS.	
dorsalis, Thoms.	.. 318

PANARGYROPS, Först.	217
---------------------	-----

PELTASTES.	
dentatus, Curt.	.. .. 3
dissectorius, Curt.	.. .. 8
fasciatus, Doum.	.. .. 5
micratorius, Illig.	.. .. 5
nectatorius, Illig.	.. .. 5
nigrator, Lep.	.. .. 8
pini, Curt.	.. .. 3

PELTOCARUS, Thoms.	.. 4
--------------------	------

PERILISSUS.	
bipunctatus, Brisch.	.. 219
bucculentus, Holmgr.	.. 250
flavopictus, Marsh.	217, 253
fumatus, Bridg.	.. 131
Gorskii, Holmgr.	.. 263
limitaris, Holmgr.	.. 261
macropygus, Holmgr.	.. 277
modestus, Marsh.	.. 253
praerogator, Marsh.	.. 171
seminiger, Voll.	.. 255
sericeus, Marsh.	.. 254
soleatus, Holmgr.	.. 277
subcinctus, Holmgr.	.. 258
vernalis, Holmgr.	.. 257

PERISPUDA, Först.	.. 230
-------------------	--------

PHAENOSEMUS, Först.	56
---------------------	----

PHOBETES.	
cerinostomus, Pfank.	.. 228
leptocerus, Pfank.	.. 228

PHRUDUS.	
monilicornis, Bridg.	.. 268

PICROSTIGEUS.	
recticauda, Thoms.	.. 63

PIMPLA.	
dentata, Fab.	.. 3
strigator, Fab.	.. 107

PLECTISCUS.		PAGE	SAOTUS.		PAGE
pallipes, Grav.	..	316	brevispina, Thoms.	..	169
			compressiusculus, Thoms.	..	170
POLYBLASTUS.			SCOLOBATES.		
albovinctus, Htg.	..	294	crassitarsus, Grav.	..	272
arcuatus, Holmgr.	..	299	italicus, Grav.	..	272
brunnicans, Holmgr.	..	307	varipes, Smith.	..	82
calcator, Brisch.	..	306	SCOPESUS.		
cancer, Htg.	..	390	guttiger, Thoms.	..	149
carinatus, Holmgr.	..	306	nigricollis, Thoms.	149,	150
caudatus, Holmgr.	..	298	rufolabris, Thoms.	..	148
caudatus, Htg.	..	290	rufonotatus, Thoms.	..	149
Drewseni, Schiöd.	...	295	SCORPIORUS.		
femoralis, Holmgr.	..	285	marginatus, Thoms.	..	299
grammicus, Holmgr.	..	303	sphaerocephalus, Thoms.	..	296
grossus, Brisch.	..	291	SPANOTECNUS.		
haemosternus, Hal.	..	289	filicornis, Thoms.	..	255
hilaris, Holmgr.	..	299	lutescens, Thoms.	..	256
infestus, Holmgr.	..	292	vernalis, Thoms.	..	257
laevigatus, Holmgr.	..	287	SPHEGOPHAGA.		
mutabilis, Holmgr.	..	297	vesparum, Morl.	..	133
oelandicus, Holmgr.	..	306	SPUDAEUS.		
palustris, Holmgr.	..	285	atratus, Thoms.	..	177
propinquus, Holmgr.	..	298	STENOMACRUS.		
Stenhammari, Holmgr.	..	294	brevicaudatus, Thoms.	..	68
POLYCLISTUS.			femoralis, Thoms.	..	77
facialis, Thoms.	..	27	fortipes, Thoms.	..	69
POLYONCUS.			ochripes, Thoms.	..	75
buccinator, Thoms.	..	262	STIPHROSOMUS.		
erythrocephalus, Thoms.	..	262	Antilope, Thoms.	..	235
POLYTRERES.			fuscicornis, Thoms.	..	237
virgultorum, Thoms.	..	140	foveolator, Thoms.	..	237
PRIONOPODA.			iratus, Pfank.	..	234
Canadensis, Harr.	..	272	montanus, Thoms.	..	237
PRIOPODA.			scaber, Brisch.	..	234
xanthopsana, Holmgr.	..	275	SYCHNOLETER.		
PROMETHES, Först.			geniculosus, Thoms.	..	243
..	..	116	SYMBOETHUS, Först.		
PSILOSARGE, Först.			..	..	178
..	..	178	SYNDIPNUS.		
RHAESTUS.			assimilis, Thoms.	..	250
lativentris, Thoms.	..	173	punctiscuta, Thoms.	..	251
RHORUS.			scotopterus, Thoms.	..	131
mesoxanthus, Kriech.	..	270	transfuga, Thoms.	..	248
			xanthostomus, Thoms.	..	249

SYNODYTES.	PAGE	TRYPHON— <i>continued.</i>	PAGE
assimilis, Thoms. ..	250	aulicus, Grav.	156
SYNOMELIX.		axillaris, Ste.	157
albipes, Pfank.	174	basalis, Ste.	137, 209
SYRPHOCTONUS, Först	88	bicolor, Grav.	149, 149
TACHYPORTHUS		bicornutus, Holmgr. ..	181
italicus, Krch.	272	bidentatus, Ste.	304
TRACHYDERMA, Grav.	2	bifasciatus, Zett. ..	296
TREMATOPYGUS		bimaculatus, Desv. ..	137, 250
leucostomus, Brisch. ..	217	bisculptus, Grav. ..	296
procurator, Ste.	293, 298	braccatus, Grav.	185
rubiginosus, Grav. ..	178	brunnicans, Grav. ..	307
TRICHOCALYMMUS, Th.	298	calcar, Grav.	137, 306
TRICHOCALYMMA		calceolatus, Grav. ..	137
plebejum, Woldst.	306	caligatus, Grav.	158
TRICHOMASTIX		cephalotes, Grav. 137, 194,	197
pallipes, Thoms.	127	ceratophorus, Thoms. ..	179
polita, Voll.	127	chrysopus, Grav.	137, 287
TRICLISTUS		clypeator, Grav.	137
aethiops, Th.	39	colon, Grav.	143
congener, Holmgr.	38	colorator, Zett.	206
curvator, Holmgr.	36	confinis, Holmgr.	182
Holmgreni, Holmgr.	37	conspicuus, Ste.	135
lativentris, Thoms.	39	cothurnatus, Grav. ..	295
longicalcar, Thoms.	37	dorsalis, Grav.	150
niger, Thoms.	40	elegans, Ste.	204
nitifrons, Thoms.	36	elegantulus, Grav. ..	13
podagricus, Holmgr.	34	erythrozonius, Först. ..	115
pallipes, Holmgr.	36	erythrocephalus, Grav. ..	262
pubiventris, Thoms.	38	erythrocerus, Grav. ..	147
spiracularis, Thoms.	38	erythropalpus, Gr. ..	175
squalidus, Holmgr.	40	evolans, Grav.	146
TRYPHON		extirpatorius, Grav. ..	287
aethiops, Cress.	28	facialis, Ste.	185
alacer, Grav.	194	fasciatus, Grav.	137, 311
albipes, Grav.	174	flavicinctus, Grav. ..	137
albocinctus, Grav.	137, 191	flavilabris, Ste.	137
albopictus, Grav.	248	flavipes, Grav.	137, 230
albovinctus, Grav.	294	flavomaculatus, Ste. ..	137, 212
anceps, Ste.	194, 195	formosus, Grav.	165
apiarius, Gr.	214	frontator, Zett.	58
armillatorius, Grav. ..	154, 156	fulvilabris, Grav. ..	137, 137
assimilis, Holmgr.	250	gnathoxanthus, Gr. ..	200
atriceps, Ste.	182	Gorskii, Ratz.	263
		haematodes, Grav. ..	101
		haemorrhoidicus, Htg. ..	309
		haemosternus, Hal. ..	289
		hamulus, Grav.	152
		helophilus, Thoms. ..	182
		humilis, Grav.	137, 203
		incestus, Holmgr.	187
		insolens, Grav.	145
		integrator, Grav.	137

TRYPHON—*continued*.

PAGE

involutor, Grav. . .	137, 270
iratus, Grav. . .	137, 234
lateralis, Grav. . .	251
laticeps, Grav. . .	137, 196
limitaris, Blanch. . .	261
lineola, Ste. . .	137, 213
litoratorius, Zett. . .	201
longipes, Grav. 149, 149,	150
lucidulus, Grav. . .	196
luteifrons, Grav. . .	154
luteomarginatus, Grav. . .	189
maculicollis, Ste. . .	161
marginatorius, Grav. . .	205
marginellus, Grav. . .	198
melanocerus, Grav. . .	137
mesoleptoides, Ste. . .	199
mesothanthus, Grav. . .	270
mitigosus, Grav. . .	137, 212
multicolor, Grav. . .	168
mutator, Zett. . .	225
naevius, Grav. . .	261
naevius, var. 1, Grav. . .	168
nanus, Grav. . .	278
nasutus, Grav. . .	137
neustriæ, Ratz. . .	285
niger, Grav. . .	168
nigriceps, Grav. . .	246
nigricollis, Grav. . .	149, 150
nigricornis, Zett. . .	112
nigritarsus, Grav. . .	137
nigrilineatus, Grav. . .	137
nitidus, Grav. . .	137
notatus, Grav. . .	137, 250
obscurus, Ste. . .	298
ochrostomus, Grav. . .	
opticus, Grav. . .	164
orbitalis, Grav. . .	259
pachysoma, Ste. . .	206
parvulus, Grav. . .	292, 293
pastoralis, Grav. . .	297
petulans, Grav. . .	146, 257
pictus, Grav. . .	207
pinguis, Grav. . .	300
praerogator, Grav. . .	171
pratensis, Grav. . .	298
procurator, Ste. . .	298
proditor, Grav. . .	298
propinquus, Grav. . .	298
punctus, Grav. . .	270
pyriformis, Ratz. . .	167
quadratus, Ste. . .	183
quadrilineatus, Grav. . .	137, 251

TRYPHON—*continued*.

PAGE

quadrisculptus, Grav. . .	137
quinquecinctus, Gr. . .	198, 200
ridibundus, Grav. . .	137, 195
rubiginosus, Grav. . .	178
rufolabris, Zett. . .	148
rufulus, Ste. . .	135
rufus, Grav. . .	135
rutilator, varr. 1 et 2, Grav. . .	184
rutilator, varr. 3 et 13, Grav. . .	182
rutilator, varr. 4, Grav. . .	185
rutilator, varr. 5, 6, 8, Grav. . .	184
rutilator, varr. 9 et 10, Grav. . .	187
rutilator, varr. 11, Grav. . .	186
sanguinatorius, Ratz. . .	301
sanguinicollis, Grav. . .	159
scalaris, Grav. . .	201
scapularis, Ste. . .	155
Scoticus, Desv. . .	13, 270
scotopterus, Grav. . .	131, 137
semicaligatus, Grav. . .	145
sexcinctus, Grav. . .	197
sexlicturatus, Grav. . .	201
sphaerocephalus, Grav. . .	296
sternoxanthus, Grav. . .	162
subfasciatus, Ste. . .	212, 285
subnitidus, Grav. . .	193
subrufus, Grav. . .	252
subspinosus, Grav. . .	137
succinctus, Grav. . .	198
sylvestris, Grav. . .	158
testaceus, Zett. . .	274
triangulatorius, varr. 1, Grav. . .	192
tricolor, Grav. . .	137, 191
trisculptus, Ste. . .	296
ustulatus, Desv. . .	141
varicornis, Grav. . .	244
varitarsus, Grav. . .	294
vellicans, Grav. . .	176
vesparum, Ratz. . .	133
vepretorum, Grav. . .	144
vernalis, Grav. . .	257
virgultorum, Grav. . .	140
vulneratus, Zett. . .	223
xanthostomus, Grav. . .	137, 249
zonarius, Grav. . .	308
zonatus, Ste. . .	137

TYLOCOMNUS

scabrus, Grav. . .	2
--------------------	---

ZOOTREPHUS

Holmgreni, Thoms. . .	115
-----------------------	-----

A List of the Enumerated Hosts.

* Extra-British species are marked by an asterisk.

LEPIDOPTERA.

	PAGE		PAGE
<i>Thecla quercus</i> , L. ...	281	<i>Mamestra persicariae</i> , L. ...	iii
<i>Smerinthus ocellatus</i> , L. ...	273	<i>Dianthaecia</i> ...	6
<i>Sesia bembeciformis</i> , H. ...	164	<i>Hadena chenopodii</i> , SV. ...	100
<i>Cossus ligniperda</i> , F. ...	127	<i>Salebria formosa</i> , Hw. ...	18
<i>Limacodes testudo</i> , SV. ...	10, 11	<i>Pyralis farinalis</i> , L. ...	26, 27
<i>Zygaena</i> ...	29	<i>Botys terrealis</i> , Tr. ...	41
<i>Nola cicatricalis</i> , Tr.* ...	38	<i>Scopula olivalis</i> , SV. ...	44
<i>Arctia urticae</i> , E. ...	6	<i>Scoparia truncicolella</i> , Stn. ...	45
<i>Eriogaster lanestris</i> , L. ...	7	<i>Homoeosoma nimbella</i> , Z. ...	44
<i>Liparis salicis</i> , L. ...	172	<i>Rhodophaea consociella</i> , H. ...	42
<i>Bombyx neustria</i> , L. ...	6, 285	<i>Tortricides</i> ...	27, 49, 83
<i>quercus</i> , L. ...	4, 5, 110	<i>Tortrix</i> ...	26, 35, 38, 44
<i>trifolii</i> , SV. ...	4, 4	<i>xylosteara</i> , H. ...	48
<i>callunae</i> , L. ...	4, 4, 5, 7	<i>viridana</i> , L. ...	37
<i>Poecilocampa populi</i> , L. ...	6	<i>heparana</i> , SV. ...	266
<i>Lasiocampa quercifolia</i> , L. ...	4	<i>decretana</i> , Tr. ...	17
<i>Saturnia carpini</i> , SV. ...	2, 4	<i>Rileyana</i> , Grote*. ...	37
<i>pyri</i> , Schiff*. ...	6	<i>Penthina dimidiana</i> , So. ...	48
<i>Odontoptera</i> (<i>Gonodontis</i> , Hüb.) ...	8	<i>Paedisca solandriana</i> , L. ...	267
<i>Ennomos</i> ...	8	<i>semifusca</i> , Hw. ...	37
<i>Pericallia</i> (<i>Hygrochroa</i> , Hüb.) ...	8	<i>Retinia resinana</i> , L. ...	306
<i>Amphydasis betularia</i> , L. ...	8	<i>Stigmonota rufimitrana</i> , G. ...	49
<i>Biston</i> ...	8	<i>Xylopaeda Fabriciana</i> , L. ...	35
<i>Rumia</i> (<i>Opisthographis</i> , Hüb.) ...	8	<i>Eupoecilia angustana</i> , H. ...	18
<i>Cabera pusaria</i> , L. ...	296	<i>Tineae</i> ...	27
<i>Emmelesia alchemillata</i> , L. ...	39	<i>Psecadia pusiella</i> , Roemer ...	310
<i>Eupithecia trisignata</i> , HS. ...	35, 36	<i>Yponomeuta padella</i> , L. ...	19, 26, 42, 168
<i>absynthiata</i> , L. ...	225	<i>cognatella</i> , H. ...	56
<i>abbreviata</i> , Ss. ...	281	<i>malinella</i> , Zett. ...	17, 19
<i>castigata</i> , H. ...	225	<i>20-punctata</i> , Rtz. ...	19
<i>Anticlea berberata</i> , SV. ...	93, 281	<i>Depressaria heracleella</i> , DeG. ...	18
<i>Dicranura bifida</i> , H. ...	6	<i>angelicella</i> , H. ...	98
<i>erminea</i> , Esp.* ...	6	<i>scopariella</i> , Hein. ...	19, 38
<i>Stauropus fagi</i> , L. ...	6, 7	<i>Gelechia populella</i> , L. ...	35, 49
<i>Asteroscopus sphinx</i> , Hufn. ...	284	<i>notatella</i> , H. ...	50
<i>Bryophila ravula</i> , Hb.* ...	6	<i>Nothris verbascella</i> , SV. ...	17, 37, 38
<i>Acronycta psi</i> , L. ...	6	<i>Gracillaria semifasciella</i> , Hw. ...	20
<i>Simyra venosa</i> , Bk. ...	8, 225	<i>phasianipennella</i> , H. ...	110
<i>Leucania turca</i> , L. ...	14	<i>Heliodines Roesella</i> , L. ...	123
<i>Triphaena fimbria</i> , L. ...	7	<i>Lithocolletis</i> ...	35
<i>Trachea piniperda</i> , P. ...	281		

HYMENOPTERA.†

	PAGE		PAGE
<i>Sphex</i> ...	27	<i>Vespa vulgaris</i> , Linn. ...	135
<i>Pemphredon unicolor</i> , Fab.* ...	159	<i>rufa</i> , Linn. ...	135
<i>Crabro leucostoma</i> , Linn. ...	186	<i>germanica</i> , Fab. ...	135

† The Rev. F. D. Morice has kindly assisted me with the synonymy of many names in the text.

HYMENOPTERA.—continued.

	PAGE		PAGE
<i>Osmia rufa</i> , Linn. ...	134	" <i>melanaspis</i> , Htg. ...	285
<i>Neurotoma flaviventris</i> , Retz. ...	154	" <i>Bergmanni</i> , Dhlb. ...	164
<i>Lyda</i>	252	" <i>miliaris</i> , Panz. 157, 159, 164, 282, 287	
<i>Pamphilus silvaticus</i> , Linn. ...	270	<i>Pachynematus albipennis</i> , Htg. ...	131
<i>Cimbex femorata</i> , Linn. 136, 164, 270		<i>Pristiphora ruficornis</i> , Ol. ...	255
<i>Trichiosoma lucorum</i> , Linn. 136, 247		" <i>betulae</i> , Retz. 145, 249	
" <i>tibialis</i> , Leach. 247, 270		" <i>conjugata</i> , Dhlb. ...	202
" <i>Scalesi</i> , Leach. 136, 247		" <i>aethiops</i> , Zadd.* ...	175
" <i>vitellinae</i> , Linn. 136, 247		" <i>geniculata</i> , Htg.* 198, 201	
" <i>pratense</i> , Curt. ...	136	<i>Lygaeonematus pini</i> , Retz. 266, 266	
<i>Clavellaria amerinae</i> , Linn.* ...	247	" <i>compressus</i> , Htg.* 266	
<i>Abia fasciata</i> , Linn. ...	142	<i>Phyllotoma microcephala</i> , Klug. ...	265
<i>Arge enodis</i> , Linn. ...	273	" <i>vagans</i> , Fall. 264, 265	
" <i>ustulata</i> , Linn. ...	275	<i>Eriocampoides limacina</i> , Retz. 264, 264	
" <i>rosae</i> , DeG. ...	273	" <i>varipes</i> , Klug. 219, 251	
" <i>pagana</i> , Panz. ...	273	" <i>annulipes</i> , Klug. 264	
" <i>berberidis</i> , Fab.* ...	273	<i>Mesoneura opaca</i> , Fab. 154, 165, 286, 311	
<i>Schizoceros geminatus</i> , Gir. ...	264	<i>Blennocampa assimilis</i> , Fall. ...	286
<i>Lophyrus virens</i> , Klug. ...	198	<i>Periclista melanocephala</i> , Fab. 154, 165, 182, 277	
" <i>dorsatus</i> , Panz. ...	205	" <i>pubescens</i> , Zadd.* 154, 165, 206	
" <i>pini</i> , Linn. 7, 7, 144, 157, 196, 205, 206, 306, 310		<i>Scolioneura tenella</i> , Klug.* ...	277
" <i>sertiferus</i> , Fourc. ...	205	<i>Entodecta pumila</i> , Klug. 265, 302, 314	
" <i>similis</i> , Htg.* ...	206	<i>Fenusa</i> 265, 313, 314, 315	
" <i>polytomus</i> , Gir.* 145, 168		" <i>nigricans</i> , Klug. 277, 279, 302	
<i>Cladius pectinicornis</i> , Fourc. 163, 196, 197		<i>Harpiphorus lepidus</i> , Klug. ...	159
<i>Trichiocampus viminalis</i> , Fall. 93, 136, 157, 159, 302, 302		<i>Athalia spinarum</i> , Fab. 154, 166, 181, 198, 256	
" <i>ulmi</i> , Linn. ...	196	" <i>lineolata</i> , Lep. 132, 165	
<i>Priophorus padi</i> , Linn. ...	196	<i>Selandria</i> 165, 202, 258	
" <i>tristis</i> , Zadd. ...	155	" <i>serva</i> , Fab. ...	244
<i>Hemichroa alni</i> , Linn. ...	197, 202	" <i>Sixi</i> , Voll. ...	244
" <i>crocea</i> , Geoff. ...	202	" <i>stramineipes</i> , Klug. ...	167
<i>Leptocercus luridiventris</i> , Fall. 249, 249		<i>Strongylogaster cingulatus</i> , Fab. ...	169
<i>Micronematus monogyniae</i> , Htg. 287		<i>Eriocampa ovata</i> , Linn. 157, 202, 287	
<i>Croesus septentrionalis</i> , L. 177, 202, 225		<i>Poecilostoma candidata</i> , Fall. 258, 275	
" <i>latipes</i> , Vill. ...	165, 255	<i>Emphytus</i>	192
<i>Holcocneme Erichsoni</i> , Htg. 157, 255, 256		" <i>cinctus</i> , Linn. ...	286
<i>Pontania leucosticta</i> , Htg. ...	310	" <i>rufocinctus</i> , Retz. ...	287
" <i>viminalis</i> , Htg. ...	170	" <i>filiformis</i> , Klug. 312, 316	
" <i>proxima</i> , Lep. ...	287, 310	<i>Taxonus glabratus</i> , Fall. ...	246
" <i>gallicola</i> , Steph. ...	159	<i>Loderus vestigialis</i> , Klug. ...	176
" <i>gracilis</i> , Gimm.* ...	286	<i>Dolerus</i> 172, 187, 245, 255	
<i>Nematus</i> 59, 153, 159, 165, 257, 302, 310		" <i>gonager</i> , Fab. ...	176
" <i>coryli</i> , Ratz. MS.* ...	202	<i>Rhogogaster punctulatus</i> , Klug. 225, 238	
" <i>cirrhopus</i> , Brisch. MS.* 286		" <i>viridis</i> , Linn. 225, 227, 238, 241	
<i>Pteronus salicis</i> , Linn. 154, 159, 160, 202		<i>Macrophya diversipes</i> , Schr. 272	
" <i>dimidiatus</i> , Lep. ...	160	" <i>ribis</i> , Schr. ...	154
" <i>ribesii</i> , Scop. 163, 197, 202, 213, 219, 261, 306		<i>Allantus arcuatus</i> , Fourc. ...	146
" <i>pavidus</i> , Lep. ...	164, 202	<i>Tenthredo</i> 146, 148	
" <i>myosotidis</i> , Fab. ...	297	" <i>mesomela</i> , Linn. ...	166
" <i>virescens</i> , Htg. ...	164	<i>Cynips Kollari</i> , Htg. 49, 159	
		<i>Alysiidae</i>	135
		<i>Chalcididae</i>	134

COLEOPTERA.

	PAGE		PAGE
<i>Coccinella 7-punctata</i> , Linn. ...	98	<i>Leiopus</i>	61
<i>Dermestes vulpinus</i> , Fab. ...	42	<i>Adimonia pomonae</i> , Scop.* ...	83
<i>Anobium pertinax</i> , Linn.* ...	25	<i>Heledona agaricola</i> , Fab. ...	72
„ <i>domesticum</i> , Fourc. ...	27, 90	<i>Hypera polygoni</i> , Linn. ...	122, 123
<i>Saperda scalaris</i> , Linn. ...	61		

DIPTERA.

	PAGE		PAGE
<i>Sciara nigripennis</i> , Rtz.*	71	<i>Syrphus ribesii</i> , Linn.	99
<i>Lasiosoma luteum</i> , Mcq.	57	„ <i>balteatus</i> , DeG.	83, 84, 86,
<i>Xiphura atrata</i> , Linn.	27	93, 98	
<i>Odontomyia viridula</i> , Fab.	26	„ <i>pinastri</i> , Rtz.*	83
<i>Pipiza noctiluca</i> , Linn.	83, 101	<i>Lonchaea tarsata</i> , Fln.	27
<i>Platychirus albimanus</i> , Fab.	85	<i>Lipara lucens</i> , Mg.	159
<i>Syrphus</i> 83, 83, 83, 86, 93, 95, 96			
98, 100, 101, 113, 114, 118			
123, 127.			

INDEX.

	PAGE		PAGE
ACROTOMUS, Holmgr.		DYSPETES, Först.	
alacer, Grav.	194	praerogator, Linn.	171
laticeps, Grav.	196	ECLYTUS, Holmgr.	
lucidulus, Grav.	196	fontinalis, Holmgr.	266
mesoleptoides, Ste.	199	ornatus, Holmgr.	266
ridibundus, Grav.	195	ERROMENUS, Holmgr.	
sexcinctus, Grav.	197	analís, Brisch.	310
succinctus, Grav.	198	brunnicans, Grav.	307
ADELOGNATHUS, Holmgr.		calcator, Müll.	306
brevicornis, Holmgr.	317	fasciatus, Grav.	311
chrysopygus, Grav.	317	frenator, Grav.	309
dorsalis, Grav.	318	plebejus, Woldst.	306
pallidipes, Grav.	316	punctulatus, Holmgr.	309
BASSUS, Fall.		zonarius, Grav.	308
albosignatus, Grav.	85	EUCEROS, Grav.	
annulatus, Grav.	87	albitarsus, Curt.	283
laetatorius, Fab.	82	crassicornis, Grav.	280
multicolor, Grav.	85	serricornis, Hal.	282
tricinctus, Grav.	84	unifasciatus, Voll.	282
variicoxa, Thoms.	86	EURYPROCTUS, Holmgr.	
CATOLYPTUS, Holmgr.		albopictus, Grav.	248
antilope, Grav.	235	alpinus, Holmgr.	242
delusor, Linn.	236	annulatus, Grav.	240
fortipes, Grav.	234	atomator, Müll.	245
fuscicornis, Gmel.	237	chrysostomus, Grav.	246
CHORINAEUS, Holmgr.		defectivus, Grav.	244
asper, Grav.	20	geniculosus, Grav.	243
cristator, Grav.	16	lateralis, Grav.	251
flavipes, Bridg.	18	minutus, Bridg.	248
funebriis, Grav.	17	mundus, Grav.	242
longicornis, Thoms.	18	nemoralis, Fourc.	241
talpa, Hal.	20	nigriceps, Grav.	246
tricarínatus, Holmgr.	19	notatus, Grav.	250
COLPOTROCHIA, Holmgr.		xanthostomus, Grav.	249
elegantula, Schr.	13	EXENTERUS, Htg.	
CTENOPELMA, Holmgr.		aurifluus, Hal.	210
mesoxantha, Grav.	270	basalis, Steph.	209
nigra, Holmgr.	271	bimaculatus, Holmgr.	213
xanthostigma, Holmgr.	271	Curtisi, Hal.	204
DIABORUS, Först.		elegans, Steph.	204
litratorius, Linn.	201	exstirpatorius, Hlg.	211
		flavilabris, Holmgr.	209
		gnathoxanthus, Grav.	206

EXENTERUS—*continued*. PAGE

hostilis, Holmgr.	210
limbatellus, Holmgr.	211
lineola, Steph.	213
marginatorius, Fab.	205
mitigosus, Grav.	212
pachysoma, Steph.	206
phaeorrhoeus, Hal.	207
pictus, Grav.	207

EXOCHUS, Grav.

aethiops, Grav.	39
albicinctus, Holmgr.	51
alpinus, Zett.	47
antiquus, Hal.	39
Britannicus, Morl.	43
congener, Holmgr.	38
curvator, Fab.	36
decoratus, Holmgr.	47
erythronotus, Grav.	46
flavomarginatus, Holmgr.	45
Fletcheri, Bridg.	50
globulipes, Desv.	37
gravipes, Grav.	41
gravis, Grav.	42
intermedius, Morl.	31
lativentris, Thoms.	39
lentipes, Grav.	49
longicalcar, Thoms.	37
niger, Bridg.	40
nigripalpis, Thoms.	44
nitidifrons, Thoms.	36
notatus, Holmgr.	48
pallidipes, Holmgr.	36
parvispina, Thoms.	50
pictus, Holmgr.	46
podagricus, Grav.	34
prosopius, Grav.	43
septentrionalis, Holmgr.	51
spiracularis, Thoms.	38
squalidus, Holmgr.	40
tibialis, Holmgr.	49

EXYSTON, Schiöd.

brevipetiolatum, Thoms.	192
cinctulum, Grav.	191
subnitidum, Grav.	193

GRYPOCENTRUS, Ruthe.

albipes, Ruthe.	314
anomalus, Brisch.	314
cinctellus, Ruthe.	312
incisulus, Ruthe.	313

HOMOCIDUS, Morl.

abdominator, Bridg.	95
biguttatus, Grav.	94
bizonarius, Grav.	90
caudatus, Thoms.	93

HOMOCIDUS—*continued*. PAGE

cinctus, Grav.	89
crassicus, Thoms.	106
deplanatus, Grav.	100
dimidiatus, Schr.	102
elegans, Grav.	109
emarginatus, Morl.	108
fissorius, Grav.	98
flavolineatus, Grav.	96
hygrobius, Thoms.	113
incisus, Thoms.	104
longiventris, Thoms.	106
niger, Morl.	101
obscuripes, Holmgr.	91
ornatus, Grav.	99
pallidipes, Grav.	111
pectoratorius, Grav.	92
pictus, Grav.	104
pulcher, Holmgr.	112
punctiventris, Thoms.	94
reflexus, Morl.	105
signatus, Grav.	112
strigator, Fab.	107
Sundevalli, Holmgr.	101
tarsatorius, Panz.	97
xanthaspis, Thoms.	108

HYPERACMUS, Holmgr.

crassicornis, Grav.	21
-----------------------------	----

LABROSSYTA, Först.

scotoptera, Grav.	131
---------------------------	-----

LATHROLESTUS, Thoms.

bipunctatus, Bridg.	278
macropygus, Holmgr.	277
marginatus, Thoms.	278
ungularis, Thoms.	279

MESOLEIUS, Holmgr.

armillatorius, Grav.	154
aulicus, Grav.	156
axillaris, Steph.	157
bicolor, Grav.	149
brachyacanthus, Parf.	144
caligatus, Grav.	158
caninae, Bridg.	165
colon, Grav.	143
compressiusculus, Thoms.	170
dorsalis, Grav.	150
dubius, Holmgr.	163
elegans, Parf.	151
erythrocerus, Grav.	147
fallax, Holmgr.	140
filicornis, Holmgr.	166
formosus, Grav.	165
furax, Holmgr.	163
haematodes, Grav.	161

MESOLEIUS— <i>continued</i> .	PAGE	NOTOPYGUS, Holmgr.	PAGE
hamulus, Grav.	152	emarginatus, Holmgr.	254
ignavus, Holmgr.	152	ORTHOCENTRUS, Grav.	
maculicollis, Steph.	161	attenuatus, Holmgr.	59
molestus, Holmgr.	155	corrugatus, Holmgr.	56
multicolor, Grav.	168	frontator, Zett.	58
niger, Grav.	168	fulvipes, Grav.	60
nigricollis, Grav.	150	marginatus, Holmgr.	57
opticus, Grav.	164	monilicornis, Thoms.	59
pini, Bridg.	143	petiolaris, Thoms.	60
pyriformis, Ratz.	167	protuberans, Holmgr.	62
renovatus, Morl.	169	radialis, Thoms.	62
rufolabris, Zett.	148	sannio, Holmgr.	58
rufonotatus, Holmgr.	149	stigmaticus, Holmgr.	55
scapularis, Steph.	155	OTOBLASTUS, Först.	
segmentator, Holmgr.	160	luteomarginatus, Grav.	189
semicaligatus, Grav.	145	PERILISSUS, Holmgr.	
sepulchralis, Holmgr.	142	buccinator, Holmgr.	262
sternoxanthus, Grav.	162	erythrocephalus, Grav.	262
tenuiventris, Holmgr.	153	filicornis, Grav.	255
ustulatus, Desv.	141	luteolator, Grav.	263
variegatus, Jur.	159	lutescens, Holmgr.	256
vepretorum, Grav.	144	minutus, Bridg.	265
virgultorum, Grav.	140	naevius, Gmel.	261
MESOLEPTUS, Grav.		orbitalis, Grav.	259
attenuatus, Bridg.	226	pallidus, Grav.	258
bipunctatus, Grav.	219	pictilis, Holmgr.	264
cingulatus, Grav.	227	rufoniger, Grav.	257
fugax, Grav.	222	spilonotus, Steph.	258
glacialis, Woldst.	230	triangulatus, Bridg.	260
indefessus, Grav.	218	PERIOPE, Hal.	
leptocerus, Grav.	228	auscultator, Hal.	28
macrodactylus, Holmgr.	229	PERISPUDUS, Thoms.	
paludicola, Holmgr.	220	facialis, Grav.	232
prosoleucus, Grav.	227	sulphuratus, Grav.	231
ruficornis, Grav.	225	PHTHORIMUS, Först.	
sordidus, Grav.	229	anomalus, Morl.	125
testaceus, Fab.	224	compressus, Desv.	124
typhae, Fourc.	220	PICROSTIGEUS, Thoms.	
villosulus, Thoms.	221	anomalus, Holmgr.	63
vulneratus, Zett.	223	POLYBLASTUS, Htg.	
xanthostigma, Gr.	223	annulicornis, Gir.	291
METOPIUS, Panz.		bidentatus, Steph.	304
dentatus, Fab.	3	Bridgmani, Parf.	293
dissectorius, Panz.	8	cothurnatus, Grav.	295
fuscipennis, Wesm.	7	marginatus, Holmgr.	299
micratorius, Fab.	5	melanostigmus, Holmgr.	303
peltator, Marsh.	9	parvulus, Grav.	292
MICROLEPTES, Grav.		pastoralis, Grav.	297
splendidulus, Grav.	22	pinguis, Grav.	300
MONOBLASTUS, Htg.		pratensis, Grav.	298
chrysopus, Gmel.	287	pyramidatus, Holmgr.	304
extirpatorius, Grav.	287		
longicornis, Holmgr.	288		
neustriæ, Schr.	285		
palustris, Holmgr.	285		

POLYBLASTUS— <i>continued</i> . PAGE		STENOMACRUS, Thoms. PAGE	
rivalis, Holmgr.	299	affinis, Zett.	75
sanguinatorius, Rtz.	301	agilis, Holmgr.	72
sphaerocephalus, Grav.	296	binotatus, Holmgr.	76
subalpinus, Holmgr.	302	caudatus, Holmgr.	67
unicinctus, Bridg.	293	cognatus, Holmgr.	74
variitarsus, Grav.	294	concinus, Holmgr.	68
Wahlbergi, Holmgr.	302	confinis, Holmgr.	73
Westringi, Holmgr.	301	cubiceps, Thoms.	77
POLYCLISTUS, Först.		curvicaudatus, Brisch.	68
femoralis, Fourc.	24	deletus, Thoms.	69
flavipes, Ratz.	27	exerens, Thoms.	74
mansuetor, Grav.	25	flaviceps, Grav.	66
PRIONOPODA, Holmgr.		incisus, Grav.	67
glabra, Bridg.	276	intermedius, Holmgr.	73
stictica, Fab.	274	laricis, Hal.	69
xanthopsana, Grav.	275	pusillus, Zett.	75
PROMETHUS, Thoms.		ridibundus, Grav.	70
albicoxis, Thoms.	118	silvaticus, Holmgr.	77
cognatus, Holmgr.	120	ventralis, Holmgr.	71
Dodsi, Morl.	119	TREMATOPYGUS, Holmgr.	
dorsalis, Holmgr.	122	albipes, Grav.	174
festivus, Fab.	123	atratus, Holmgr.	177
laticarpus, Thoms.	120	erythropalpus, Gmel.	175
pulchellus, Holmgr.	121	lativentris, Holmgr.	173
scutellaris, Bridg.	119	vellicans, Grav.	176
sulcator, Grav.	117	TRICAMPTUS, Först.	
PROTARCHUS, Först.		apiarius, Grav.	214
rufus, Grav.	135	TRICHOMASTIX, Voll.	
SCOLOBATES, Grav.		flavipes, Holmgr.	127
auriculatus, Fab.	272	TRYPHON, Fall.	
italicus, Grav.	272	brachyacanthus, Gmel.	180
SMICROPECTRUS, Thoms.		brunniventris, Grav.	187
jucundus, Holmgr.	200	compunctor, Grav.	188
quinquecinctus, Grav.	200	consobrinus, Holmgr.	187
SPHECOPHAGA, Westw.		elongator, Fab.	179
vesparum, Curt.	133	ephippium, Holmgr.	182
SPHINCTUS, Grav.		exclamationis, Grav.	182
serotinus, Grav.	10	helophilus, Grav.	181
		nigripes, Holmgr.	180
		rutilator, Linn.	183
		signator, Grav.	185
		trochanteratus, Holmgr.	184
		vulgaris, Holmgr.	184
		ZOOTREPHUS, Thoms.	
		rufiventris, Grav.	115

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